MARINE REVIEW.

VOL. X. CLEVELAND, O., SEPTEMBER 27, 1894. No. 13.

Coal Freight Agreement—Fall Rates.

With the close of the thirty-day agreement among vessel owners and brokers in Cleveland, providing for a 50-cent rate on all soft coal carried to Lake Superior, it was understood that a renewal of the contract, if such it may be called, was to be made. On the last day, one broker placed three boats at 45 cents, and the result was a stormy meeting of the owners, who had been sending many of their boats up light and were disturbed by indications of a break in the ranks after they had held out for a full month in support of the fixed rate. A new and more stringent agreement was drawn up, and with the exception of the boats put in on the last day, there have been no further reports of the rate being cut. Telegrams from several leading owners in ports other than Cleveland announced a willingness to continue the agreement, and committees have since been working with the managers of ore companies, with a view to having them join the individual owners and refrain from taking any more of the coal for their boats at 45 cents. When the indications of a break occurred, leading owners who have been most active in support of the 50-cent rate, threatened to put boats in at 20 or even 10 cents a ton if any more cutting occurred, and the very firm stand taken by a few of the leaders had most to do with the continuation of the agreement.

The combination works hardest with the brokers, who are losing commissions, and who are also fearful in a few instances of not fully satisfying outside customers, but there are some very important points at stake, as one owner puts it. "Let us suppose," he says, "that we fail in the movement, and that coal is carried during October, or at any time this fall, below the rate fixed by the owners. What will be the result? Coal shippers will go ahead next winter making sales on the low estimates of lake freight that prevailed during the low-priced sales of last winter, and they will come into the freight market with only a low freight for contracts and a still lower basis of wild freights. They will feel satisfied that a failure in the present movement will prevent any possibility of organization among vessel owners during another season, and in that regard they are entirely right. On the other hand, success with the present agreement will cause every coal shipper on the lakes to go slow in making sales at low prices and give the matter of lake freight the consideration that is due to it. Let it be admitted that shipments this fall are to be restricted on account of the 50-cent freight, and the vessel owner has the best side of the question anyhow. If supplies forwarded this fall are short, the business of next season will be increased by additional shipments, on which allowance will be made for a better lake freight."

Notwithstanding a very limited demand as yet for vessels to take grain from either Duluth or Chicago to Buffalo, the ore movement continues sufficiently large to absorb all tonnage offered at the advanced rates established early in the month. At this writing there is a fair demand for ore carriers at 85 cents from the head of the lakes, 70 cents from Marquette and 50 cents from Escanaba, bnt it is admitted that these rates will not hold without a more active grain movement from Duluth as ore shippers have had ample opportunity to fulfill their contracts with the furnaces. Neither will higher freights be paid on any great quantity of ore, in event of grain freights improving, as there is enough ore down now to meet all requirements in the iron ore trade until the opening of another season. Duluth vessel brokers claim that railways in the northwest are only now completing the work of clearing tracks and repairing bridges, which was begun after the forest fires, and that there will be some grain to move next week. There is practically no grain in Buffalo, and it is to be expected, of course, that there will at least be shipments during October for the filling up of elevators there and for storage in vessels later on, but the outlook as regards grain is very uncertain and not very encouraging to the vessel owner. Some comment has been heard regarding blocks of ore taken for the balance of the season at 85 cents from the head of the lakes, but the total of business of this kind is probably not more than 50,000 tons. Lumber freights have been improving, and the rate from the head of Lake Superior to Buffalo, is now quoted at $2. The full text of the soft coal freight agreement signed in Cleveland this week follows:

"We, the undersigned, hereby solemnly agree to and with each other and each with all of the other subscribers hereto and each pledges himself that for thirty days from date we will not make or be a party to any charter for ourselves or for others as brokers or otherwise, directly or indirectly, of any tonnage whatever and will not permit to be chartered any tonnage, we own or control, directly or indirectly, to carry soft coal from any Lake Erie port to any port on Lake Superior, either shore or the head of the lake, at a less freight than 50 cents per net ton, and we each agree to submit to the secretary of this meeting a list of our contract coal and to report daily hereafter vessels put in on contract."

Northern Line Passenger Boats.

Mr. F. P. Gordon, who was aboard the North West on her last trip down the lakes, says there is no doubt of the second boat, the North Land, being completed in time for the passenger trade next season. The second boat is now as well advanced, he says, as was the North West on Dec. 1 a year ago, and work on her will be resumed shortly. Mr. Gordon says the North West's passenger business on each of her sixteen trips has shown a balance on the right side, and on the whole the traffic has been fully up to expectations. Sensational newspaper reports regarding the slight delay caused by the boat drifting into shoal water at Bar point caused a cancellation of some business for late trips, and this was partly the cause of the boat being laid up a trip or two earlier than was expected. On the last trip one of the new boiler feed pumps designed by Mr. Peck was used, and Mr. Gordon says that as the only difficulty encountered with the Belleville boilers has been confined to the peculiar feed arrangement, and as this seems to have been fully overcome with the new pumps, the tubulous boilers will certainly be installed in the second boat also. Even under difficulties with the feed pumps, he says, the boat has made good time, her delays being caused by fog and time lost in locking through St. Mary's Falls canal.

On the last trip from Detroit to Cleveland several representatives of the Detroit city government, the Detroit Dry Dock Company and Detroit and Cleveland Steam Navigation Company were aboard by invitation of Mr. Gordon. Among them were Messrs. Frank E. and F. A. Kirby of the Dry Dock company, E. B. Whitcomb of the Detroit and Cleveland Steam Navigation Company and T. F. Newman of the Cleveland and Buffalo Transit Company.

Night Clearances at Escanaba.

Mr. H. A. Barr, agent of the Chicago & North Western Railway Company in charge of the iron ore docks at Escanaba, writes Cleveland vessel owners about a difficulty at that point in regard to vessel masters securing clearance papers at night. He says:

"Our deputy collector at this port, Mr. B. D. Winnegar, has been taken to task by the customs department for letting clearance blanks go out of his office. It has been the practice at this port to let blanks go up to the docks, where captains would obtain them, fill them out, and return them to the deputy collector's office here—this only during the night time. But his instructions now are that if masters want clearance papers they must go to the collector's office after them. Of course, Mr. Winnegar is at the office during the day, but at night no one is there; and as boats often come here in the night, and get away again before morning, unless there can be some arrangement made they will have to wait for their clearance pnpers. I write so you may know how it is, and if anything can be done in the matter, take such steps as may seem advisable."

Of course this is a serious matter with the large number of big ore carriers trading to Escanaba, and it will be given attention by officers of the Lake Carrier's Association.

L. P. & J. A. Smith of Cleveland will not be at a very great loss if they fail to again float the worn-out hull of the old schooner Col. Cook, and if for nothing more than peace of mind among the thousands of readers of newspapers on the lakes, who have been tempted to swear every time they have seen reference to the old hulk, and it is to be hoped that her bones will be allowed to rest on the shore of Lake Erie near Cleveland, where she was abandoned by her crew in a blow last week. For nearly half a century the story of the Lady Elgin disaster has been rehearsed in all parts of the lakes almost every time the Col. Cook entered port.

Mr. Richard Peck, expert in marine engine trials, who has been on the passenger steamer North West since her machinery was first turned over, leaves this week for the coast to take out the cruiser Maine. Capt. Campau and Engineer Frasier of the North West will very probably put in the balance of the season looking after the steamer launched by the Globe Iron Works Company several days ago, and which is to make a few trips this fall in the Northern Line.

Preparing for the Next Session of Congress.

As a result of conferences between Capt. George P. McKay, chairman of the Lake Carriers' committee on aids to navigation, and Mr. Keep, secretary of the association, a petition to the light-house board, setting forth new aids to navigation, for which appropriations will be sought from the next congress, has been prepared, and will within the coming week be presented to vessel owners and vessel masters in all parts of the lakes for signatures. The petition, which follows, embodies only such light-houses, light-ships and fog signals as are most needed and will serve to aid lake commerce in general:

To the Light-House Board, Washington, D. C.:—The Lake Carriers' Association, and the undersigned managers and owners of lake vessels, representing the tonnage set opposite their names, respectfully petition the light-house board in favor of the following aids to navigation on the great lakes:

1. Light-house and fog signal on the southeast point of North Manitou island.—Provision was made for this light in the last sundry civil bill, but was struck out in conference. The light is indispensable to the safe navigation of Lake Michigan and most urgently needed. Every season serious disasters result from the absence of a proper aid to navigation at this point.

2. Range light at Death's Door passage, Green bay, Lake Michigan.—This is an aid to navigation long recommended by your board, but not yet provided for. The heavy tonnage moving iron ore from Escanaba to Chicago is in constant need of these lights, and they have been urged for many years.

3. Grassy island, south and north end, ranges, Detroit river, Michigan.—These lights were recommended by the board in its report for the year ending June 30, 1893, but no appropriations have been made therefor. The small expense involved in erecting these range lights and their great usefulness to the enormous tonnage which passes through the river ought to secure their immediate construction. They will fully complete the lighting of the Detroit river.

4. Fog signal at Eagle Harbor, Lake Superior.—Vessel masters have for some time been strenuous in urging a fog signal in connection with the light-house at Eagle Harbor. Within a few weeks the steamer H. W. Sibley struck heavily in thick weather while close to the light house at this point, and narrowly escaped a very serious loss. This is but one of several incidents which have proved the necessity of a fog signal as an adjunct to this important light station. Eagle Harbor is a turning point for vessels bound both east and west on Lake Superior. The light is one of the most important on the entire chain of lakes, as at this point vessels fall in with the land, and a fog signal would be of special advantage to the heavier commerce bound eastward, as the nearest fog signal in the direction of the head of the lakes is at Outer island, Apostle group, while to the east there is no fog signal until Manitou island is reached.

5. Light-house and fog signal at Crisp's point, Lake Superior.—A petition signed by the owners of all the largest fleets on the lakes is now on file with the light-house board, asking for a light at this point. We respectfully refer the board to the reasons given in that petition.

6. Light-house and fog signal on Middle island, Lake Huron.—Off Middle island is the point where vessels bound north on Lake Huron shape their courses for Detour and Lake Superior, or for the Straits of Mackinaw, as the case may be. It is an important turning point, and, though there are other light houses not far distant on each side of Middle island, a new station is none the less necessary at this point. Many vessels have brought up at Middle island and severe losses have been sustained there.

7. Light-ship and fog signal near Gravelly island, Poverty passage, Lake Michigan.—Poverty passage is the most important passage between Green bay and Lake Michigan, and it is the one generally used by ore vessels trading between Escanaba and the lower lakes. This is one of the most important routes of the lake commerce, and this light ship and the one next mentioned are needed to complete its lighting. Nearly all of the commerce of Green bay, which includes the great movement of iron ore from Escanaba, amounting in one year (1892) to more than 3,000,000 tons, passes at this point between two shoals that are only a little more than a mile apart.

8. Light-ship and fog-signal where the can buoy is now located north of Squaw island, Lake Michigan.—Foul and dangerous water extends for a long distance north of the light-house on Squaw island. Vessels fearing such obstruction have to keep a considerable distance north from the light. When so doing on dark nights they run serious risk of disasters on the rocky shoal where the can buoy is now located. During the season of navigation numerous vessels pass close to this shoal every night with no means of locating it satisfactorily. If a gas buoy would be placed there it would answer the purpose perfectly, but your board will know whether such a solution of the difficulty is practical. If it is not, a proper light-ship should be put in service.

9. Fog signal, Cat Head point.—Cat Head point is one of the most important lights between Chicago and the Straits of Mackinaw. It is also the only light at the entrance of Grand Traverse bay, where there is a very considerable local traffic. A fog signal in connection with this important light is very urgently required.

10. Lighting entrance to Grand Marais harbor of refuge, Lake Superior, Michigan.—The government has expended a large amount of money for a harbor of refuge at this point, and nothing has been done towards making this expenditure useful by providing a proper light and signal there. The great usefulness of this light would be in connection with the harbor of refuge, but there is also an important lumber traffic developing at this point, which is an additional argument for the early establishment of the light. The light has been recommended by the light-house board and authorized by congress, but no appropriation has yet been made.

In petitioning your board at this time for the above mentioned aids to navigation, your petitioners, representing the entire body of vessel owners on the great lakes, have had chiefly in mind the desirability of informing the light-house board fully as to what new lights and signals they deem most necessary for the safety of life and property. We think the light-house board would be glad to know what the wishes of vessel owners and vessel masters are in this respect, and to what conclusions they have come as the result of practical experience. We are aware that some of these aids to navigation have been heretofore recommended by your board, and that others have not; but even in the case of those recommended, we know that on the board depends, in a large measure, our success in obtaining the necessary appropriations from congress. We shall ask congress at its coming session to make appropriations for these aids to navigation, and we know that with the hearty support of the light-house board we can obtain provision for all, or nearly all, of them. We know also that without such snpport we may in a great measure, if not altogether, fail. We believe that each of these aids to navigation will save many times its cost in property, to say nothing of the increased safety which they will give to human life, and we think that they are all indispensable to safe navigation. We earnestly request your board to ask the district officers of the various districts, where these proposed lights and signals are, to make a special inquiry into the need for them. Masters of lake vessels, if consulted by the local light-house officers, will be happy to furnish them with the details of their experience at these points, and with the reasons why they deem new lights and signals so necessary.

Believing the proposed additions to aids to navigation on the lakes to be in each case indispensable, we respectfully petition your board that they may be classed as such, and that we may have the hearty support of the light-house board in obtaining provision for them from congress. As owners of the property for which the light-house establishment on the lakes exists, we have chosen this particular time to submit our petition, because we know that your board must have under consideration the estimates to be submitted to the next congress by the secretary of the treasury for light-house construction, and that upon the result of such consideration our success at the next session of congress largely depends.

It is unnecessary for us to dwell upon the extent of the interests represented on this petition, or to direct your attention again to the peculiar character of lake navigation. The narrow and shallow channels, the constant proximity of vessels to dangerous shores, the great prevalence of smoke and fog, and the great and increasing size, number and value of the vessels, are all well known to the district officers and to your board. These conditions make lake navigation peculiarly dependent upon the light-house establishment, and give us, as we think, a special claim to favorable consideration.

The New Mitchell Steamer.

The steamer to be built by F. W. Wheeler & Co., of West Bay City for Capt. John Mitchell of Cleveland, W. H. Gratwick and others of Buffalo, and for which material is now being purchased, will be of the following dimensions: Length over all, 370 feet 6 inches; length between perpendiculars, 352 feet; beam, moulded 44 feet 6 inches; beam extreme, 44 feet 8 inches; depth moulded, 26 feet 3 inches. The engines will be of the builders' make, triple expansion, cylinders 20, 32½ and 55 by 42 inch stroke. Steam will be supplied by two return tubular boilers, 13 feet 6 inches diameter by 12 feet long, at a pressure of 170 pounds per square inch. The main frames will be of angle bulbs. Sheer strake and upper deck stringers will be very heavy, double butt strapped and treble riveted with 1-inch steel rivets. The water bottom will be constructed on the cellular system with four longitudinal girders on each side of center vertical keelson. This water bottom will be 54 inches deep with a capacity of 1,500 tons water ballast. She will have ten hatches, 30 feet wide by 8 feet long. Intermediate frames will be fitted forward of collision bulkhead as a protection against ice. The cabins will be of the usual steambarge type. She will be supplied with steam steerer, steam capstan and windlass, patent stockless anchor, etc.

Death of Capt. Thomas H. Hackett.

Capt. Thomas H. Hackett, who died of heart desease aboard his steamer, the Volunteer, in Detroit, Saturday, had been in the employ of Alger, Smith & Co., of Detroit for twenty-six years. He was fifty-four years of age and sailed the lakes from boyhood. Amherstburg, the little Canadian town at the mouth of the Detroit river that has furnished many trustworthy and capable masters of lake vessels, was his home early in life, but through his connection with the big Detroit lumbering firm he acquired interests on the American side of the river, and by thrift and economy left his family in comfortable circumstances. Alger, Smith & Co. regarded Capt. Hackett as a leader among their steamboat captains, and as he had been with them from the time of their beginning raft towing, he was always given the best boats to sail. He was a younger brother of the late Capt. R. J. Hackett, who was at one time a very wealthy vessel owner. Captains Andrew and Frank Hackett, the former, keeper of Bois Blanc island light, and the latter owner of a towing and wrecking plant at Amherstburg, were also his brothers. Bois Blanc island light station, where Capt. Hackett was born on Jan. 6, 1840, has been in charge of the family for a great number of years. Capt. Hackett began sailing with his brother Henry on the schooner Conductor in 1854. In 1860 he sailed the schooner E. M. Peck for Capt. Guyles of Cleveland. The next year he sailed the Augusta Handy and lost her on Spectacle reef. He afterwards sailed the tugs Zowase, Castle, John Prindiville, Torrent, Vulcan, Manistique, Schoolcraft and Volunteer. Although death resulted after only a few hours illness on the Volunteer, he had not been well for some time. His chief engineer was with him for twenty-seven years.

CAPT. THOMAS H. HACKETT.

Additional Particulars of American Line Ships.

In connection with a late announcement to the effect that the St. Louis, first of the two new American Line ships being built by the Cramps of Philadelphia, will be launched about Oct. 20, some additional details regarding the boats are given out. The gross register of the St. Louis will be 11,000 tons, which is 500 tons greater than either the New York or Paris. Following are the dimensions:

Length over all	554 feet.
Length on load water line	536 feet.
Extreme beam	63 feet.
Depth of hold	42 feet.
Draft of water	26 feet.
Gross register	11,000 tons.

The Paris measures only 526 feet on the load water line, and, as already stated, registers only 10,500 tons. In appearance the new ships will differ entirely from the Paris and the New York, inasmuch as they have straight instead of clipper stems, and carry two funnels and two instead of three masts. The masts will be ordinary pole masts with a fore-and-aft or schooner rig. The boats will have six decks. The promenade deck extends the whole length of the vessel without a break. All of the decks will be covered with wood planking.

At least 10,000 indicated horse power is expected of each of the quadruple expansion engines in the St. Louis, so that both engines will give the ship 20,000 horse power, against 18,000 for the Paris. Each engine will have four cylinders, respectfully of 36,50, 71 and 100 inches diameter. The piston stroke is 60 inches. Six steel double-ended boilers, each 20 feet long and 15 feet 7½ inches diameter, will furnish steam at about 200 pounds pressure. There are forty-eight Purves furnaces, 39 inches in diameter, and boilers are fitted with Serve's patent tubes. The total grate surface will aggregate about 830 square feet and the heating surface about 30,000 square feet. The crank shaft, eccentric straps and connecting rods will be of forged steel, and the piston rods will be of ingot steel. The valve gear will be of the link type, controlled by a steam cylinder and also by an auxiliary hand gear. Many features have been added to insure the perfect working of these engines. The columns will be of cast steel, forked bottom. The thrust blocks will be of the usual horseshoe type and the thrust shafts about 13 feet long. The line shafting will be of forged steel and the bearings of cast iron. The air pumps will be attached, but the condensers will be independent.

Tonnage of the new steel steamer I. W. Nicholas of Cleveland, as assigned by the bureau of navigation, is 2,624.03 gross and 1,857.14 net. Her official number is 100,589.

Illustrated Patent Record.

SELECTED ABSTRACTS OF SPECIFICATIONS OF A MARINE NATURE—FROM LATEST PATENT OFFICE REPORTS.

526,190. DRY DOCK. Max Moesser, Berlin, and Reinhold Erpel, Tegelort, Germany. Filed Oct. 10, 1893. Serial No. 487,733.

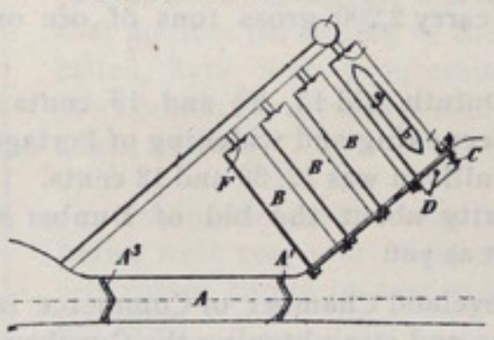
Claim.—In a canal, canalized river or similar inland navigation system, the combination with a lock where a fall of water level occurs, of a basin or series of basins communicating by doors with the water above the lock and having water inlets to the water above the lock and water outlets to the water below the lock, both adapted to be closed; said basin being adapted for the reception of vessels for repairing and other purposes.

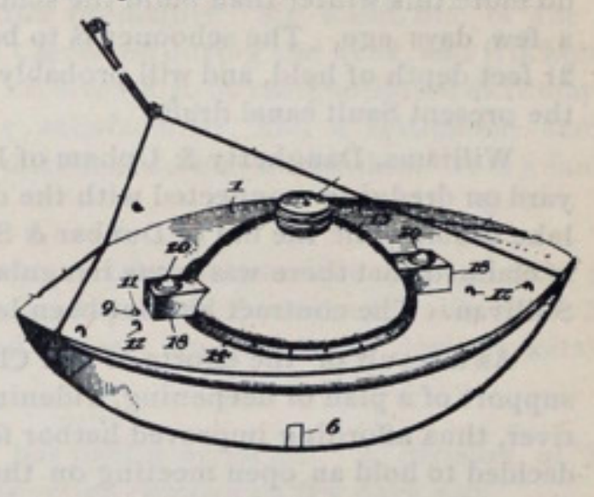
526,126. GRAVITY OIL DISTRIBUTER FOR SHIPS. John Ericson, Sabine Pass, Tex., assignor of one-half to Adelbert Phinney, Edgartown, Mass. Filed Dec. 29, 1893. Serial No. 495,111.

Claim.—First, in a boat of the class described, the combination with the hull, of the hinged keel adapted to fold thereunder or to be dropped to a position at a right angle thereto, said hull and keel having corresponding openings, and locking bolts removably inserted in the openings

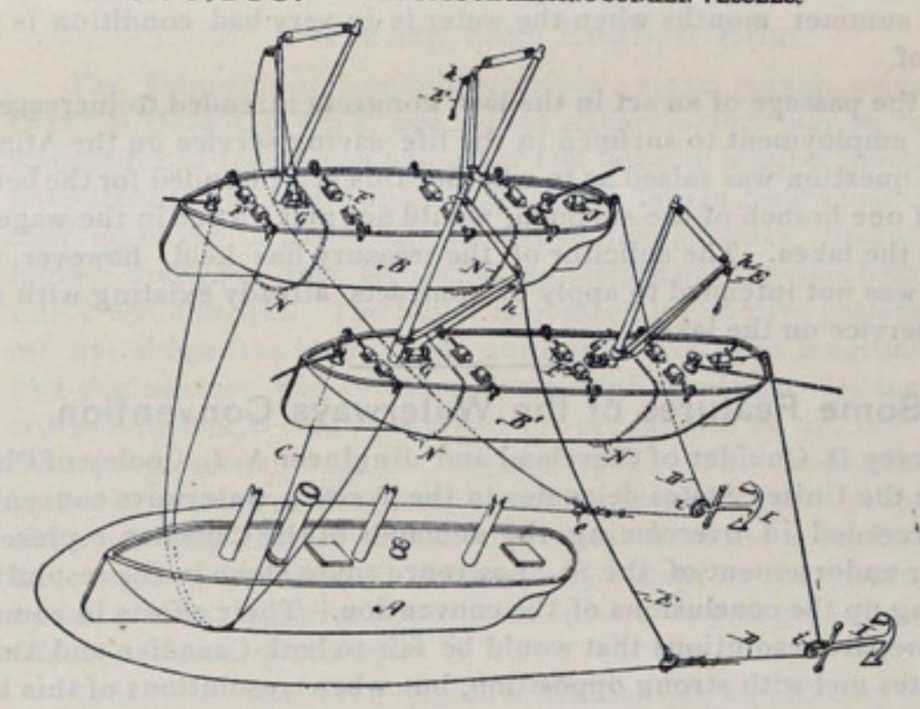
526,126. GRAVITY OIL-DISTRIBUTER

526,190 DRY DOCK





526,163. APPARATUS FOR RAISING SUNKEN VESSELS.



of the hull and keel for rigidly securing the latter in proper relative position with the former. Second, in a boat of the class described, the combination with the hull, of a superimposed oil tank secured upon the deck of the hull and provided with discharge faucets, boxes surrounding the discharge faucets and provided with openings, absorbent material in boxes, and the corrugated spring rack for locking the keys of the faucets in adjusted positions.

526,163. APPARATUS FOR RAISING SUNKEN VESSELS. Enos B. Petrie, Buffalo, N. Y., assignor of one-half to George H. Blanchard, Boston, Mass. Filed March 27, 1894. Serial No. 505,233.

Claim.—First, in an apparatus for raising sunken vessels, the combination with a wrecking vessel having a hoisting device, a number of lifting loops adapted to pass vertically around the hull of the sunken vessel, a submerged guide wheel or pulley anchored beyond one end of the vessel and a draft cable for drawing said loops under the sunken vessel passing forward and upward around said guide wheel and connected with the hoisting device on said wrecking vessel. Second, the combination with a hoisting apparatus, of a clutch adapted to grip the hoisting cable and consisting of a block having a tapering opening and an internally screw-threaded socket communicating with the large end of said opening, wedges seated in said opening and adapted to grip the cable, an externally screw-threaded adjusting sleeve or follower engaging with said socket, a spring interposed between the large end of said wedges and said sleeve or follower and a spring bearing against the small ends of the wedges, whereby the latter are held in their proper relative position.

Home Seekers' Excursion—Sept. 25 and Oct. 9. Ask agents of Nickel Plate road. 153-8

Around the Lakes.

S. A. Murphy, who raised the steamer Ogemaw, which was sunk in Green bay, bought her at marshal's sale in Detroit a few days ago for $16,000.

Capt. James Warwick, Sr., aged seventy-eight, for fifty years a sailor on the lakes and commander of several vessels, died at his home near Sarnia a few days ago.

Breyman Bros. of Toledo have been buying more dredging apparatus. They purchased the dredge John Todd and two dump scows, Wednesday, from the Kirby-Carpenter Company of Menominee, Mich.

The customs department steamer Calumet, built by David Bell of Buffalo and to be used for boarding incoming vessels at Chicago, is said to be a very fast wooden craft. Her trial occurred at Buffalo, Saturday, and she will be ready to go to Chicago shortly.

The Fisher Electrical Manufacturing Company of Detroit will equip steamer No. 53, the freight boat now nearing completion at the yard of the Globe Iron Works Company, with a complete lighting plant, including two twin navy sets and about 250 incandescent lamps.

It is now probable that Capt. James Davidson of West Bay City will not do more this winter than build the schooner upon which work was begun a few days ago. The schooner is to be 245 feet over all, 41 feet beam and 21 feet depth of hold, and will probably carry 2,200 gross tons of ore on the present Sault canal draft.

Williams, Daugherty & Upham of Duluth bid 15, 20 and 13 cents a yard on dredging connected with the deepening and widening of Portage lake canal, while the bid of Dunbar & Sullivan was 12, 30 and 12 cents. It is claimed that there was some irregularity about the bid of Dunbar & Sullivan. The contract has not been let as yet.

As a result of the efforts of the Cleveland Chamber of Commerce in support of a plan of deepening, widening and straightening the Cuyahoga river, thus affording improved harbor facilities, the council of the city has decided to hold an open meeting on the evening of Oct. 3, with a view to discussing extensive inner-harbor work. A scheme for flushing the river during summer months when the water is in very bad condition is also talked of.

By the passage of an act in the last congress intended to increase the time of employment to surfmen in the life saving service on the Atlantic coast, a question was raised as to whether this act, intended for the betterment of one branch of the surfmen, would not make a cut in the wages of men on the lakes. The solicitor of the treasury has held, however, that the act was not intended to apply to contracts already existing with men in the service on the lakes.

Some Features of the Waterways Convention.

Harvey D. Goulder of Cleveland and Engineer A. L. Cooley of Chicago were the United States delegates in the Toronto waterways convention who succeeded in overcoming the demands of the Canadian representatives for endorsement of the St. Lawrence route alone in the resolutions summing up the conclusions of the convention. Their efforts in committee to prepare resolutions that would be fair to both Canadian and American routes met with strong opposition, but when resolutions of this kind were finally presented to the convention they went through without any delay.

The resolution calling for the appointment of an international commission of engineers to determine the outflow of the several lakes and report upon such works on the Niagara river as will control the level of Lake Erie, was prompted by Mr. Wheeler of the Cleveland chamber of commerce and other delegates who have given some study to the opinions of George Y. Wisner of Detroit on this subject.

It was noticeable that there was little attention given to the Georgian bay—Lake Ontario ship canal question in the convention. Referring to this scheme,Mr. Cooley is reported to have said: "This old canal project will cost more than the great Manchester ship canal. It is one of those things which may be done in the far future, but it is not to be considered seriously as one of the questions of the day. I believe in deep waterways between the upper lakes, but the best route is by Lake Erie, and thence on the American side of Lake Ontario. This canal on American soil around Niagara falls could be constructed for $23,000,000,and I believe the route is much better than could be obtained by enlarging the Welland canal."

Mr. Cooley has some very decided opinions relative to the attitude of the railways toward deep waterways. He did not believe, he said during a discussion in the convention, that there was an intelligent railroad man in the United States fighting the waterways. What the railroads said was: "If you make these waterways you will build up the country, and we shall reap benefits; go ahead, we are with you." Considering the question from a railway standpoint, the domestic movement was constant; the foreign movement was a surplus movement. The domestic transportation determined the line of foreign shipment. There had not been a time when there was not a better route down the St. Lawrence than down the Erie canal, and yet there had never been a time when there was not more freight down the Erie canal than down the St. Lawrence. So far as the representatives from the United States were concerned, they were not advocating any particular route; what they were advocating was deep water to the sea. Many routes would one after the other come in time. "As surely," concluded Mr. Cooley, "as this continent is laid out as it is, so surely will the people be bound together by commercial links that will ignore all questions of nationality and all questions of sentiment and patriotism, because the almighty dollar will after all settle that question, and if necessary we will be all one people if we cannot settle it in any other way."

Boiler Question in Navies.

A writer in Engineering of London, issue of Sept. 14, discussing the boiler question, contends that while the practice of four leading naval powers—France, Russia, Italy and the United States—in the matter of the ratio of boiler capacity to engine power required, is almost identical, it is diametrically opposed to what is done in Great Britain. "In the ships of all these countries," he says "such a boiler installation is fitted as compared with engine power, as to require a very moderate assistance from forced draught in case of emergency, and which secures the continuous maintenance at sea of a power in excess of the legend natural draught powers of our later and larger vessels. These people rely upon their boilers; we do not. We provide forced draught fans, and then just what boilers there may be room for when all other demands are satisfied.

"The Americans adopt the precept laid down down by Dr. Elgar in his paper on 'Fast Ocean Steamers,' read last summer at the meeting of the Institution of Naval Architects. Speaking of a large proportion of boiler power, Dr. Elgar said: 'The necessity for this is also well known. The best results upon short trials are obtained with large engines and small boilers, but the best results at sea are obtained with smaller engines and large boilers. This is also an instance in which short trials fail as a standard of what can be done upon a long voyage at sea.' So the Americans put in rather larger boilers than we do, and rather smaller engines, that is, speaking generally. To secure a high speed on paper, their ships are tried at a so-called normal draught, with only a proportion of their load on board, and as the displacements published are usually those of this normal draught, the information is often misleading."

In Reality a Power Company.

Promotors of the Minnesota Canal Company, who have been trying to secure appropriations for their scheme from the government, are now admitting their plans. The real purpose of the company is to construct an extensive system of navigable canals and waterways with a view of utilizing the powers of the streams that flow into the head of Lake Superior. These streams have a fall of 600 feet or more in a few miles, and two canals are planned, one to tap the waters of the St. Louis river, discharging it at the elevation of 610 feet on top of the hill above Duluth, the other tapping streams to the easterly and discharging them also above the city. By the canal as at first designed 140,000 horse power is claimed to be available, but it is designed to enlarge the prism of the canal to such an area as will give 300,000 horse power. All of this, the engineers compute, will be utilized within a few years, and it is believed by them to be possible to so increase storage reservoirs as to ultimately supply, through a canal 300 feet wide on the bottom and 30 feet deep, 1,150,000 horse power.

He had the Practical Schooling of a Sailor.

Capt. Adolph Freitsch, who has gained some notoriety by working his way down the lakes and crossing the Atlantic alone in a frail schooner, it appears, is a Finlander and consequently a former subject of the czar of Russia. He was born in the city of Abo, Finland, located on the Finnish bay at a distance of about 100 miles from St. Petersburg. Abo is a seaport of about 25,000 inhabitants. The captain's father was an attorney. Up to his nineteenth year he attended the Abo high school and naval academy. At an early age he evinced a predilection for the sea and enjoyed sailing when he was very young. At the age of nineteen Capt. Freitsch went to sea. He went through all the practical schooling of a sailor. He was employed on board English and American vessels for some years and made several voyages to the West Indies. Then his father died and he decided to marry and take up a home in America. He was not successful ashore and after drifting to Chicago and Milwaukee he earned some money in the lumber business and became interested in a lumber schooner. The schooner was lost shortly after he had purchased her, and with her went all his savings. Later on followed his determination to build a small boat in which to return alone to his native country.

A four-masted wooden schooner, which is to carry 5,600 feet of canvas, was launched at Bath, Me., last week and named Augustus Palmer. The boat was built by N. T. Palmer and is 208.8 feet over all, 39.5 feet beam and 19.2 feet depth.

Conneaut Car Ferries.

Although specifications and drawings of the new car ferries, to run between Conneaut, O., and Port Dover, Ont., were sent to lake ship builders several days ago with the understanding that bids were to be submitted by Monday last, there has been no announcement of a contract or any reports of bids received. It is understood that the new company has been trying to float bonds in the amount of $400,000 for the building of boats, and that the builders will be expected to take some of these bonds as part payment, so that there is, of course, considerable question about the financial part of the enterprise being sufficiently advanced to warrant an early beginning of work on the boats. Col. Dick, president of the Pittsburgh, Shenango & Lake Erie Railway Company and the principal promoter of the car ferry scheme, said recently that negotiations were pending for the charter of one of the Toledo & Ann Arbor ferries, to be used on the Conneaut—Port Dover route during the coming winter, but as there has been nothing done at Conneaut towards the construction of slips or railway approaches for a ferry service, it would seem as though some rapid work would be necessary to bring about an actual movement of cars across the lake before another season comes around.

Underbilling of Coal.

One vessel owner, Capt. M. W. Humphreys of the Sulphite Fiber Company of Detroit, owners of the steamer John F. Eddy and consort Shaw, has taken a stand in the matter of underbilling of coal cargoes, by which it is claimed vessels have been defrauded of their freight on a difference between the amount carried and that indicated by the bill of lading. Of course, there is some question about this case or any other of its kind ever getting into court, although the owners of the coal have begun suit against the boats. The Eddy and Shaw took coal from Sandusky to Milwaukee for the Columbus & Hocking Valley Coal Company. Capt. Humphreys insisted upon having a man selected by him tally out the cargo. The coal company refused to permit of this, and work was stopped for twenty-six hours, until it was found that the boat had the legal right to have a representative record the weights. Captain Humphreys claims that the Eddy unloaded 122 tons more than the amount called for in the bill of lading, and that the Shaw's bill of lading was 106 tons short of her cargo. A part of the Shaw's cargo, about 333 tons, was held to cover demurrage, amounting to $350 for delay of the boats, and also to cover freight on the excess of cargo. The coal was taken to Chicago, Capt. Humhreys preferring that suit should be brought against the boats there. The coal company claims that the weights on which the coal was billed were mine weights, and refused to pay freight on any other weights If the case is ever brought to trial, the details of it and the outcome will be very interesting to vessel owners who have heard complaints of underbilling of coal for many years past.

Notes of Interest to Mariners.

Fog signals at Beaver island light station, Michigan, reported as disabled, have been repaired and are again in operation.

Following are widths between piers, at entrance, at Pierhead light stations on Lake Michigan: Charlevoix pierhead light station, 160 feet; Portage lake harbor pierhead light station, 370 feet; Manistee pierhead light station, 185 feet; Ludington pierhead light station, 250 feet; White River pierhead light station, 190 feet; Holland pierhead light station, 220 feet; Kalamazoo pierhead light station, 225 feet; Port Washington, pierhead light station, 170 feet; Sheboygan pierhead light station, 270 feet; Two Rivers pierhead light station, 245 feet; Menominee pierhead light station, Green bay, 360 feet.

Announcement is made of the intention of the light-house board to establish one of the St. Mary's river lights that has been very much needed. A notice announces that about Oct. 1 a fixed white light, with two fixed red sectors, will be established on Churchville point, the east point of Sugar island. The light will be shown, at a height of 30 feet above the water, from a lens lantern on a post rising from the center of a square lamp house. The post will be natural color and the house white. The southerly red sector will cover the black spar buoy, No. 49, off Church point crib, and mark the turning point to and from the channel between Squirrel island and Church point. The northerly red sector will cut the southerly red sector of Manhattan shoal light and mark the turn of channel midway in the bend.

Learman's Helmet.

In the REVIEW of May 10 a combination life jacket and helmet, patented by George Learman of Cleveland, was illustrated and described. Mr. Learman holds that people who are drowned in surf and heavy sea meet death on account of the smothering action of water splashing into the face, more so than from the inability of the wearer of the jacket to keep above water. His helmet, attached to the life jacket, is made of oil cloth, and means are provided for sight and air through glass covered holes in front of the eyes and an air tube above the head.

A trial of the helmet was made in Cleveland, Monday, by one of the members of the Cleveland life saving crew, who from the life boat jumped into heavy breakers at the mouth of the harbor and remained full five minutes in the water, face to the seas. Upon being taken into the life boat again the surfman's head, after removal of the helmet, was almost as dry as when he entered the water. The contrivance seems to be of considerable merit.

Iron Mining Matters.

As had been expected, Milwaukee holders of second-class bonds of the Chapin Mining Company are planning to have their say at the sale to take place next month. One firm of attorneys, Timlin & Glicksman, have sent out a circular to all holders of second-class bonds proposing that holders of these bonds contribute in cash 25 per cent. of the face value of the bonds, for the purpose of paying off the first mortgage bonds, or to bid in the property at sale. As there are various complications in the affairs of the company, especially as regards its relations toward the fee owner, it is not probable that the Milwaukee schemes will carry against the people who are now practically in possession of the mine.

The announcement that the receivers of the Colby and others of the Penokee and Gogebic Consolidated mines are about to turn the properties over to the stockholders is a little premature. Mr. Rand, one of the receivers of the company, was in Cleveland during the week, and it is known that matters pertaining to the receivership, or reorganization as it may be called, have been progressing satisfactorily, and a settlement among stockholders may be expected after the close of navigation. It is a family affair, anyhow.

During the period when boats to take ore from the head of Lake Superior were very scarce last week, shipments from the Biwabic mine, Mesabi range, had to be suspended entirely, on account of dock pockets being filled.

Another mining company has paid a dividend. A division of $1 a share was made by the Lake Angeline company a few days ago.

A Very Fast English Boat

The Engineer of London describes a steam launch, owned by R. H. Lebat of Hampton Wick, and named Hibernia, that may be regarded as a competitor of the Fiseen and other fast boats of similar construction that have attracted a great deal of attention of late in New York. The length over all of the British-built boat is 48 feet 3 inches; breadth, 7 feet 3½ inches; draught, 1 foot 4½ inches, and depth of propeller below the water line, 2 feet 5 inches. The boiler is of steel, locomotive pattern, with barrel five-sixteenths inch thick, quintuple riveted in longitudinal seams. The engines are two-cylinder, both high pressure, 7⅛-inch diameter, stroke 6 inches, revolutions about 750 per minute up to 1,050 revolutions per minute when doing the highest speed. The propeleller has three blades of hammered double shear steel, with carefully prepared surface and knife edge, keyed in a wrought steel boss and accurately balanced. The engines are of small dimensions, except in the wearing and hard working parts, and here the dimensions are very large, and at first glance disproportionately strong.

At ordinary speed the Hibernia behaves like an ordinary boat, cutting her way through the water and leaving a moderate impression in the form of shore waves. With a touch of the regulator she leaps forward, and as the speed increases, she gradually sinks a little by the stern, rises a little at the head, until at a certain high speed the bow rises clean out of the water, and the boat flies along at the top of it, throwing a double wall of spray.

FOUR steel engravings of U. S. war ships and a color plate of the steel steamer Gratwick will be forwarded by MARINE REVIEW, 516 Perry-Payne Bldg., Cleveland, O., to any address on receipt of $1.

Details of ship-canal schemes may be had these days in job lots. One of the latest is among the most ridiculous. A dispatch from Elkhart, Ind., talks of a canal being built through private enterprise from Michigan City, on Lake Michigan, to Toledo on Lake Erie.

$1.50 to Niagara and return and $1.00 to Buffalo and return are the exceedingly low rates the Cleveland and Buffalo Line announces for their excursion Saturday night, Sept. 29. Steamer leaves wharf, No. 137 River street at 6:15 p. m. and returns in time for business Monday morning, allowing the entire Sunday for sight seeing at the Falls. This is the lowest rate ever made from Cleveland for the Falls trip.

AN EXCELLENT LIBRARY FOR A MARINE ENGINEER, CHEAP—KEY TO ENGINEERING; WHAT AN ENGINEER SHOULD KNOW ABOUT ELECTRICITY; ENGINEERS' CATECHISM. ANY ONE OF THESE ARE WORTH A DOLLAR, BUT ALL THREE CAN BE HAD FOR $1. SEND TO THE MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, O. MONEY REFUNDED IF NOT SATISFACTORY.

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,761 vessels, of 1,261,067.22 gross tons register in the lake trade. The lakes have more steam vessels of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of steam vessels of 1,000 to 2,500 tons on the lakes on June 30, 1893, was 318 and their aggregate gross tonnage 525,778.57; in all other parts of the country the number of this class of vessels was, on the same date, 211 and their gross tonnage 314,016.65. The classification of the entire lake fleet on June 30, 1893, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,731	828,702.29
Sailing vessels	1,205	317,789.37
Canal boats	743	76,843.57
Barges	82	37,731.99
Total	3,761	1,261,067.22

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
1889	225	107,080.30
1890	218	108,515.00
1891	204	111,856 45
1892	169	45,168.98
1893	175	99,271.24
Total	991	471,891.97

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1893.	1892.	1891.	1893.	1892.	1891.
No. vessel passages	12,008	12,580	10,191	3,341	3,559	4,207
Ton'ge, net regist'd	9,849,754	10,647,203	8,400,685	7,659,068	7,712,028	8,698,777
Days of Navigation	219	223	225	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

IT IS not probable that tariff and silver legislation will crowd out all other matters in the next session of congress. Why would it not be well, then, for the officers of boards of trade and chambers of commerce, who have rightfully entered protest against custom laws that do not admit of statistics of lake commerce being secured, to take advantage of the opportunity offered by a business session of the national legislature, and seek changes of the customs laws as regards reports of cargoes taken on and discharged by lake vessels? Let the collector of each customs district furnish to every vessel registered in his district blanks, upon which owners or agents should be compelled to furnish, once a month, reports of trips made by their vessels during the month and the freight carried. The owner or agent need not be required to do more than name the ports at which his vessel had taken on and discharged cargo during the month, together with the amount of cargo taken on and discharged at the several ports. Such data might be forwarded to the collector at the port from which the vessel hails, so as to keep a check on all vessels. The local officer could in turn forward the reports to Washington, and the salary of an additional clerk or two in the bureau of statistics, treasury department, would represent practically all the expense that would be attached to compiling from these blanks, properly filled out, a summary of the entire ton-mileage of the lakes. The business of each port in ore, coal, grain, flour, lumber etc., would also be derived from such reports, as they would show the movements of every vessel on the lakes. Unfortunately, some of the vessel owners have seemed unwilling to encourage any plan for securing statistics of lake commerce, although the assistance required of them, under a system like that proposed here, would be practically of no account, excepting possibly in the case of a few of the passenger and freight boats trading to numerous shore points. But this feeling among a few owners is certainly not of the proper spirit and it might be overcome by energetic action on the part of commercial bodies in which the value of such statistics is appreciated.

CAPT. C. H. WESTCOTT of Detroit, talking from the standpoint of one who has had experience in the steamboat inspection service, seeks to criticise the action of Lawyer Cooley of Bay City, in writing the REVIEW, after a trip around the lakes, regarding neglect of vessel captains in the matter of blowing passing signals. Mr. Westcott says it is the duty of every citizen of the United States, regardless of his position, to formally complain against offending officers of vessels. "Why did not Mr. Cooley do this," he adds, "instead of making general charges through the newspapers?" Now this is certainly a poor argument in defense of government officers hired to enforce laws, especially when it is known that in the same interview from which the foregoing is quoted Mr. Westcott says that Mr. Cooley was correct in all he said. Mr. Westcott ought to know that private individuals should not be put to the burden of sacrificing themselves in order to secure public rights. It is certainly no credit to the treasury department, or the steamboat inspection service on the lakes, to hold that one set of officers are quietly awaiting complaints of violation of the law from private individuals, while admitting that another branch of the same department, the revenve cutter service, established for the express purpose of locating such offenders, is unable to find them.

PROBABLY as early as the next annual meeting of the Lake Carriers' Association in Detroit in January next, subjects of no less importance than the widening of the Lime-Kilns crossing, the construction of a second canal at St. Clair Flats, widening of the Hay lake channel, and the enlargement of the lock now in use at Sault Ste. Marie to dimensions even greater than that of the new lock, will demand serious attention from vessel owners. Any or all of these great improvements might be begun now, and upon their completion they would not be found at all in advance of the growing lake commerce. The talk that is heard of depression in the lake trade is not due to a decrease in the amount of freight to be carried. The difficulty relates to low freight rates, on account of a great supply of ships. Lake Superior business this season is far in advance of all previous seasons, as regards the tonnage movement. The St. Mary's Falls canal report for the season will undoubtedly show wonderful gains. These proposed new works will not be considered as live legislative projects until they are endorsed by the Lake Carriers' Association, which is the representative organization of lake shipping. Not all of them can be taken up at once, but the relative importance of them will undoubtedly be considered at the next general meeting of the association.

EARLY IN July, when it was announced that the Canadian Sault canal was to be open for traffic in a few weeks, the REVIEW, after a careful investigation of the work at the time, ventured the prediction that the canal would not be open for the passage of a vessel of any kind this season. Now it is announced that water is being let into the canal, but it would seem that even the summer months of next season will not see it ready for use. A dispatch from the Sault says that *all* that remains to be done to complete the work is to place the gates in position, install the machinery for their operation and remove the dams at the upper and lower entrances of the canal. It is to be remembered that a plan of floating the several lock gates into position, and erecting them by means of a big pontoon after water has been let into the canal, is to be tried.

IN ANSWER to the statement that Cramps hope to get as great or greater speed out of the new American Line ships than has been shown by the big Cunard liners, the Marine Journal of New York refers us to an address of Mr. Charles H. Cramp, delivered some time ago before the Society of Naval Architects and Marine Engineers, in which the great difference between the Cunarders and the American boats as regards size and horse power is indicated officially by Mr. Cramp. There can be no question as to the facts regarding size or horse power of the ships, but in all reference to the American boats the Journal takes no account whatever of quadruple expansion engines using steam at high pressure, induced draft and other features of advanced practice adopted by the Philadelphia builders.

"THE STRANGEST thing to me in the action of the senate regarding the raft towing regulations, which were thrown out of the river and harbor bill," says Serretary keep of the Lake Carriers' Association, "is that the senate committee on commerce should, in fixing the minimum size of rafts to be towed through the St. Mary's river, use figures greater than the dimensions of any raft ever towed through that waterway." Mr. Keep was in Europe when the rafting regulations were forced out of the river and harbor bill. The subject will be taken up in the next session of congress on the same lines that the Lake Carriers' Association has all along pursued, and Mr. Keep's knowledge of the details will be of great service to the vessel owners.

GEN. WILLIAM WARD DUFFIELD of Detroit, Mich., has been appointed by the president to succeed Prof. T. C. Mendenhall as chief of the coast and geodetic survey. Gen. Duffield has a most distinguished record as a civil engineer and is said to be thoroughly equipped as a scientific expert in all branches of learning necessary to efficient administration of the office to which he has been appointed. If he is to be a member of the light-house board, it is to be hoped that his services in that institution will be of more value to the lakes than those of his predecessor.

FRANK TAFF of Whitestone, L. I., has gained some notoriety through several of the New York papers describing a fin-propelled boat, to which he has given a great deal of study. But many others who have gone before Mr. Taff have tried to apply the principles of the fish's tail movement to boats with fruitless results.

In General.

Now it is proposed to establish a direct line of steamships between Antwerp, France, and Canada. The question will probably be presented to the dominion parliment at its next session.

It is estimated that their English trip has cost the Gould brothers close onto half a million dollars in hard cash since the Vigilant was negotiated for, and that they will spend in Europe during the coming winter the best part of another half million. Of this amount, the Vigilant cost $25,000 to buy, $10,000 to prepare and $10,000 a month to run, besides $5,000 bonus to Capt. Haff.

A notice from Philadelphia announces that the general offies of the Erie & Western Transportotion Company (Anchor Line), the Connectlng Terminal Rail Road Company, Western Warehousing Company, and the Canal and Lake Steamboat Company, located at No. 234 South Fourth street, were removed to the new General office building, No. 26 South 15th street, on Monday, Sept. 17.

A curious development is noted from England in one department of the iron ore trade. The rapid expansion in the introduction of the basic process has brought it about that a higher price is being paid for ores high in phosphorus than for similar material carrying less of that element. Phosphorus, once looked upon as the "devil" in the steel trade, is now actually sought as a friend.

Trials that have been made with the new plan of wire shafts for steamships, are said to show that when the shaft is in position and rotating stress is applied a tensile force is exerted upon the individual wires and their several fastenings—each a unit of strength sustaining its part of the total amount of stress. The strength of the individual wires and of the fastening being known, the strength of the shaft as a whole can likewise be ascertained.

Mere mention is made in the British newspapers of contracts for new ships of a size that would cause columns to be devoted to them in this country. A few days ago, the Peninsular and Oriental Steam Navigaton Company placed contracts for four steamers for their Indian trade, that are to be of 4,800 tons gross register and 6,000 tons deadweight capacity each. Two of the contracts were secured by Caird & Co. of Greenock, and one each by Messrs. Alex Stephen & Sons of Glasgow, and the Palmer's Shipbuilding Company, Jarrow-on-Tyne.

The use of oil as a fuel for steamers may now be said to be increasing. Whether it will eventually take the place of coal for the purpose is one of those things that is yet unknown. Some English steamers in the petroleum trade on the Atlantic have already been fitted with furnaces and jets to enable them to burn oil instead of coal, and some English firms are making preparations to bunker steamers with oil instead of coal. The experiments with oil have been successful enough, but the question of cost varies in different localities and is of more importance than that of practicability.—Maritime Register.

Makes His Own Oil.

A paragraph in one of the latest publications from the United States hydrographic office tells of a Norwegian vessel master, Capt. Reynolds of the bark Hovding, who keeps harpoons aboard his vessel and captures porpoises from which oil is extracted, to be used in rough weather. This vessel master, writing the Washington office of the hydrographic service, says:

"Of all the different qualities of oil I have tried, I have found porpoise oil to be the very best, as it contains scarcely any stearin and does not thicken in cold weather. On the voyage from Mobile to Antwerp, vessel deeply laden with heavy deck load of pitch pine, I am quite certain that we would have received great damage if we had not attended carefully to our oil distributor during a gale. The sea ran enormously high for this season of year. To save oil, mixed strong soap suds, which did good service, but I think oil is better and safer and is certainly less trouble to prepare. I have a small churning machine with which I mix the soap suds in a very few minutes."

It will be observed that the soap suds were here used on salt water. They are much more effective in fresh water.

Of course, readers of the REVIEW who are familiar with the Atlantic records of the Cunard ships Lucania and Campania knew that it was the former and not the latter boat that should have been credited with the title "Queen of the Seas," in the note in last week's issue about a further lowering of records. It is the Lucania that now holds the best records for both east and west bound trips.

Take No. 6.—For Buffalo, New York and Boston, it is the fast train east on the Nickel Plate road and carries through palace buffet sleeping cars. 156-8

A remarkable reduction in rates has been made to points in the west for Sept. 25 and Oct. 9. Ask agents of Nickel Plate road. 154-8

Mike, the Irish Sailor.

"We had among our crew on this voyage an Irishman, a genuine son of the soil. He kept us in almost constant merriment by his wit and his marvevlous 'bulls.' He was always in hot water. One calm day we were shifting our foretopsail. Mike was sent aloft to bear the sail off as we were hoisting it up. It had jammed at the lower side of the top sail-yard. Anybody but Mike would have clung to the topsail tie with one hand when bearing the sail off. He had no such thoughtful care of himself. He caught hold of the gantline with both hands, and throwing the whole weighed of his body outwards, got the sail in a position to clear the yard, and shouted to us to hoist away. Whether there was a flaw in the rope or not I do not know, but with the first pull it parted, and we were horrified to see the sail and the man coming down by the run. As this was a sheer fall of about 60 feet, we made up our minds that the poor fellow would be killed. He was not. As fortune would have it, the sail fell under him, and, to our amazement, he at once scrambled on to his feet. Scratching his head, he cried, 'Howley Moses, is there any wan hurt?' It was quite clear that he was not, for he continued his duties as though a fall of 60 feet was a trifling occurrence to him."—"Reminiscences of a Sailor," by Captain Wm. R. Lord.

An Office on the Pacific Coast.

The Detroit Dry Dock Company will open an office on the Pacific coast, about Oct. 1, and Mr. E. A. McAllaster, who has been in the Detroit office of that company for a number of years, has been appointed western agent. He will make his headquarters at Seattle, or Tacoma. Mr. McAllaster is a man of marked ability, and his friends think he will make a mark on the coast in his new line. The Detroit company has been doing some business in engine work throughout the Puget sound district and hopes to increase its trade.

Suez Canal Traffic.

Only three American vessels passed through the Suez canal during the calander year of 1893. The distribution of shipping in the canal by nations in 1893, as shown by the following table, will prove interesting:

	Ships.	Net tonnage.
English	2,405	5,752,934
German	272	555,750
French	190	461,197
Dutch	178	327,465
Austrian	71	166,779
Italian	67	119,827
Norwegian	40	88,674
Spanish	29	70,660
Russian	24	53,548
Turkish	34	39,601
Portuguese	10	11,309
Egyptian	4	4,441
American	3	3,200
Belgian	1	1,761
Japanese	1	1,280
Brazilian	1	634

The number of ships passing through the canal during the year was 3,341 of 7,659,068 tons net, as against 3,559 ships of 7,712,028 tons in 1892 and 4,207 ships of 8,698,777 tons in 1891. There has been a large gain in the tonnage of France, Austria and Russia, a slight loss in that of England, Italy, Norway and Turkey, and a great loss in that of Portugal. Germany shows a slight gain. England crrried 75.11 per cent.; Germany, 7.26; France, 6.02; Holland, 4.27; Austria, 2.18; Italy, 1.58; Norway, 1.16; Spain, 0.92 per cent. of the gross traffic. The number of passengers passing via the canal decreased from 189,809 in 1892 to 180,432 in 1893. Of the passengers 71,880 were soldiers.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stock of wheat and corn in store at the principal points of accumulation on the lakes on Sept. 22, 1894:

	Wheat, bu.	Corn, bu.
Chicago	26,058,000	1,953,000
Duluth	2,370,000	.....
Milwaukee	571,000	.....
Detroit	1,623,000	1,000
Toledo	3,264,000	29,000
Buffalo	1,544,000	124,000
Total	35,430,000	2,107,000

At the points named there is a net decrease for the week of 155,000 bushels of wheat, and a net increase of 206,000 bushels of corn.

On account of the death of Capt. Thomas Hackett, several changes will be made in masters of the steamers of Alger, Smith & Co., Detroit. Capt. William Rolls of the Gettysburg will take command of the Volunteer; Capt. Currie of the Torrent will sail the Gettysburg, while Ralph Hackett, a son of Capt. Thomas Hackett, and now mate of the Torrent, will command her.

"A DOLLAR SAVED IS A DOLLAR EARNED."

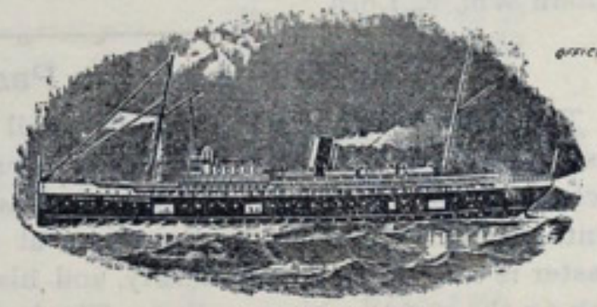
Results Obtained from the Application of

Howden's Hot Draft System

On the PASSENGER STEAMER VIRGINIA, (See Letter Below,)

And on the Coarse Freight Carrying STEAMER HARVEY H. BROWN,

Show an immense saving in fuel. A ton of cargo carried a mile on 8-10 of an ounce of fuel, or a ton of cargo carried 170 miles at the rate of 13.2 miles per hour on a cent's worth of fuel, are performances that have been attained on but one steamer on the lakes—that steamer is the HARVEY H. BROWN fitted with **HOWDEN'S HOT DRAFT SYSTEM.**



A W GOODRICH, PRESIDENT

OFFICE OF THE PRESIDENT.

GOODRICH TRANSPORTATION Co

FOOT OF MICHIGAN AVENUE.

Chicago Dec. 20th, 1893.

Frank E. Kirby, Esq.,

c/o Detroit Dry-Dock Co.,

Detroit, Mich.,

Dear Sir --

In reply to your letter of the 18th inst. inquiring about the results of the Howden System of Forced Draught now in use on our S. S. "Virginia", will say that since it has been in use we have had steady steam, and burned slack coal, which costs us $1.10 per ton less than the coal we were forced to use before we introduced the Howden System.

At the same time we applied the Forced Draught we also supplied the "Virginia" with new Condensing apparatus built by the Knowles Co., which gives a better vacuum requiring much less steam to operate than the original plant supplied by the builders.

Our saving in the price of coal has been 50 o/o. We attribute 33 1/3 o/o of the saving to the Howden System, in enabling us to burn a cheaper grade of coal and maintain steady steam.

The balnace or 16 2/3 o/o we credit to the Condensers made by the Knowles Co.,

We are so well satisfied with the results on the "Virginia" that we have since fitted the "Atlanta" with the Howden System and are now putting it in the "City of Racine," and "Indiana."

Very truly yours
A W Goodrich Pres.

"A Tale of a Smoke Stack of a Modern Lake Steamer."

Sent FREE to any Address.

"A Tale of a Smoke Stack of a Modern Lake Steamer."

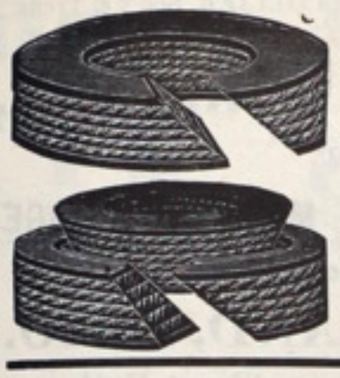
Sent FREE to any Address.

For further particulars, write the sole owners and manufacturers of the Howden apparatus for the lakes.

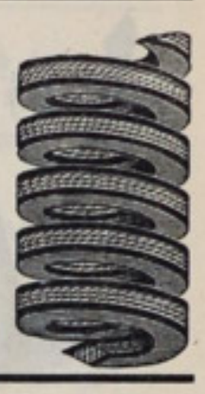
THE DETROIT DRY DOCK COMPANY,

SHIP AND ENGINE BUILDERS, DETROIT, MICH.

P. S.—"**A cent's worth of fuel, A ton of cargo, A hundred and seventy miles, At 13.2 miles per hour**" is the title of a book being prepared for this company. If you would like a copy, send your name and address.



GARLOCK PACKINGS.



Our Elastic Ring, Sectional, Spiral and Special Water Packings are the leaders in this line. For Steam, Water, Ammonia, High Speed Work and all places where packings are used they excel. Try our Special Water Packing, fully guaranteed for water end of pumps. See that our trade mark is on each package. Correspondence solicited.

NEW YORK, 136 Liberty St.
CHICAGO, 5¢ & 60 So. Canal St.
PHILADELPHIA, 28 N. 5th St.
PITTSBURGH, 99 First Ave.
OMAHA, NEB., 922 Farnam St.
ST. LOUIS, 415 Morgan St.

THE GARLOCK PACKING CO.

Factories and Main Offices: PALMYRA, N. Y. ROME, GA.

The Martin-Barriss Co.

IMPORTERS AND MANUFACTURERS OF

Mahogany, White Mahogany,

AND ALL NATIVE CABINET WOODS.

HIGH GRADES OF KILN DRIED WOODS FOR CABIN WORK AND INSIDE TRIM.

White Oak Timbers and Plank

CONSTANTLY ON HAND AND SAWED TO ORDER ON SHORT NOTICE.

654 Seneca Street, Cleveland, Ohio.

U. S. ENGINEERS OFFICE, 34 West Congress street, Detroit, Mich., September 12, 1894.—Sealed prposals for furnishing all labor, materials and appliances, and removing shoals of boulders, both bedded and loose, and other material, from vicinity of Ballard's Reef in Detroit river, will be received here until 2 p. m., standard time, October 12, 1894, and then publicly opened. All information furnished on application. O. M. POE, Col., Corps of Engrs.
Oct 4

U. S. ENGINEER OFFICE, Burlington, Vt., September 5, 1894.—Sealed proposals in triplicate, for dredging in Ogdensburg Harbor, N. Y., will be received here until 2 p. m., October 5, 1894, and then publicly opened. Full information furnished on application to Smith S. Leach, Capt. Engineers. 27

U. S. ENGINEER OFFICE, Burlington, Vt, September 5, 1894.—Sealed proposals in triplicate, for rock excavation in Otter Creek, Vt., will be received here until 2 p. m., October 5, 1894, and then publicly opened. Full information furnished on application to Smith S. Leach, Capt. Engineers. 27

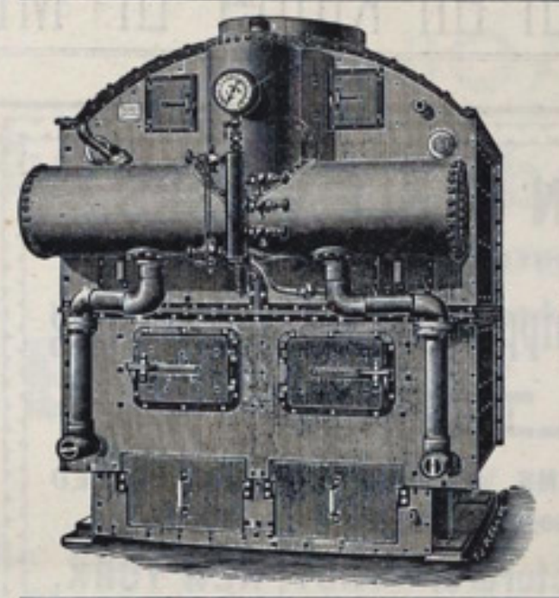
ERIE RUBBER CO.
ERIE. PA.
Manufacturers of the
KEYSTONE MARINE VALVE
THESE
RED RUBBER VALVES
ARE THE
BEST AIR & FOOT VALVES MADE.
IF YOUR DEALER DOES NOT KEEP THEM, WRITE DIRECT TO THE FACTORY.

GRUMMOND TUG LINE

WRECKING

TUG SWAIN STATIONED AT MACKINAW CITY.
TUG CRUSADER STATIONED AT THE "SOO."
TUG CHAMPION STATIONED AT DETROIT.
ALL WITH WRECKING OUTFITS ABOARD.

U. GRANT GRUMMOND, Mgr., - Detroit, Mich.



ALMY'S PATENT
SECTIONAL
Water-Tube-Boilers.

NOW USED IN
18 Passenger Boats from 70 to 160 feet long.
27 Steam Yachts from 50 to 160 feet long.
U. S. Torpedo Boat "Stiletto."
Numerous Small Launches and Stationary Boilers are giving most excellent results.

ALMY WATER-TUBE BOILER CO.,
47 CLIFFORD ST.,
PROVIDENCE, R. I.

NOTICE TO MARINERS.

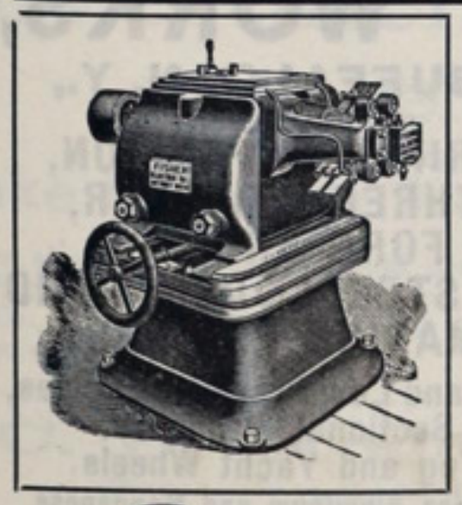
FUEL AND DOCKAGE AT POINT AUX PIN—SHIP STORES CONSTANTLY ON HAND—ALGOMA PARK HOTEL AND SUMMER RESORT.

ALGOMA PARK, At Point aux Pin, Just Above the Soo, Ontario, has been opened up as a summer resort by Messrs. Kirkwood & McKinnon of Sudbury, Ont. A new stone hotel, store, parks, etc., are the features, and a dock 200 feet long, with a depth of 20 feet of water, has been built.

The small charge of $1 will be made for tieing up at the dock, for each 24 hours or fraction thereof, for all classes of freight carriers.

They will keep a supply of fuel and ship stores of every description constantly on hand, and will have the dock lighted at night and a bell sounded in thick weather. Masters finding themselves in this locality during thick or unfavorable weather of any kind, are invited to take advantage of the accommodations offered. At out-port of customs and postoffice have been established.

KIRKWOOD & McKINNON,
ALGOMA PARK, Just above the Soo. **POINT AUX PIN,** ONTARIO.



"Ninety per cent. of the Electric Lighting Plants on the inland lakes have been installed by the Fisher Co., of Detroit, Mich.

ALL THE GREAT FLEETS ARE EQUIPPED WITH OUR PLANTS.

Fisher Electrical Mfg. Co. 183-185-187 LARNED ST., W. Detroit, Mich.

C. E. GROVER, President. WM. KENNEDY, Vice-President. W. A. COLLIER, Sec'y & Treas.

The Vessel Owners Towing Company,

W. A. COLLIER, Manager.

Wm. Kennedy, Alva B. Cris Grover, H. L. Chamberlin, C. G. Curtiss, Tom Maytham, Joe Harris, W. D. Cushing, Dreadnaught, Allie May.

DOCK OFFICE, MAIN ST. BRIDGE.
Telephone 409.
CLEVELAND, OHIO.

Steam Pumps, Hawsers, Divers, Etc., Furnished on Short Notice.

F. W. WHEELER, President.
E. T. CARRINGTON, Vice-President.
F. L. GILBERT, Secretary.

F. W. WHEELER & CO.,

WEST BAY CITY, MICH.

Builders of all kinds of METAL AND WOODEN SHIPS.

AMERICAN CHAIN CABLE WORKS.

ESTABLISHED 1865.

Cable, Dredge, Quarry, Shipping, Crane and Rafting

CHAINS.

Our DREDGE and CRANE CHAINS are made of IRON ROLLED SPECIALLY for that purpose. Send for Price List.

J. B. CARR & CO., Manufacturers, TROY, NEW YORK.

THOS. DREIN & SON,

TATNALL AND RAILROAD STS., WILMINGTON, DEL.

Builders of Metallic Life Boats and Rafts, Yachts and Pleasure Boats. Life Preservers. Outfit for Lake Steamers a Specialty.

THE "CINCINNATI"

AUTOMATIC

STEAM STEERING GEAR

A Simple, Powerful Machine. Noiseless and Sure.

SEND FOR CIRCULAR.

CRAWLEY & JOHNSTON,
119-121-125 E. Pearl St., CINCINNATI, O.

For BOLTS, NUTS, WASHERS, RIVETS Etc., Etc.

ADDRESS: Sternbergh & Son,
READING, PA.

GEO. B. CARPENTER, Pres't. BENJ. CARPENTER, Treas. JAMES CHANNON, Mgr

SOUTH CHICAGO

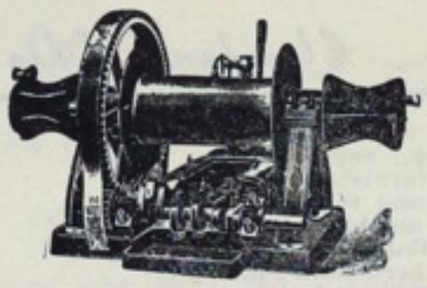
SHIP CHANDLERY COMPANY,

— DEALERS IN —

Cordage, Cotton Duck, Oakum, Paints and Oils,

TACKLE BLOCKS and MARINE HARDWARE.

170 92d Street, SOUTH CHICAGO, ILL.



JACKSON & CHURCH,

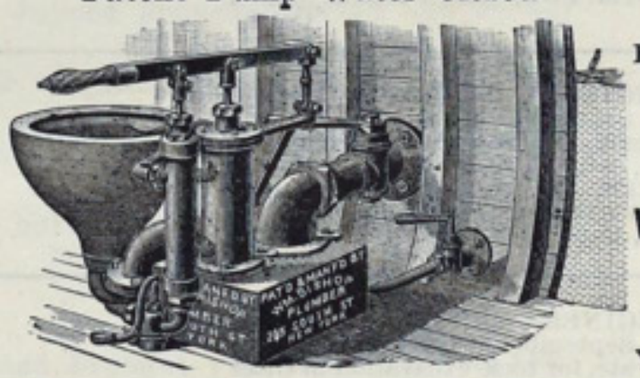
Builders of DUPLEX HOISTING and DECK ENGINES.

Plain Finished and Automatic ENGINES, From Heavy Patterns at Moderate Prices.

Vertical, Horizontal, Marine & Locomotive BOILERS Strictly First-Class and Highest Test.

Send for Circulars and Prices. SAGINAW, MICH.

Patent Pump Water Closet.



For Yachts, Pilot Boats, Naval Ships, Etc.

For above or below water line. In use on U.S. Cruisers New York, Columbia, and Battleships Indiana, Maine, Texas, Massachusetts, Etc. Our No. 4 can be put in a space 15 in. x 15 in.

WILLIAM BISHOP & SON,
205 South St., NEW YORK,
724 Third Ave., BROOKLYN.
Telephone 569 Franklin.

Yacht Fittings a Specialty.

SHIP LAMPS.

OIL AND ELECTRIC FIXTURERS

— FOR —

Steamships, Yachts, &c.

GREAT VARIETY OF DESIGNS.

Prices and Cuts on Application.

PAGE BROS. & CO.,

(FORMERLY WILLIAMS, PAGE & CO.)

227 to 233 Cambridge St., BOSTON, MASS.

H. G. TROUT,

KING IRON WORKS,

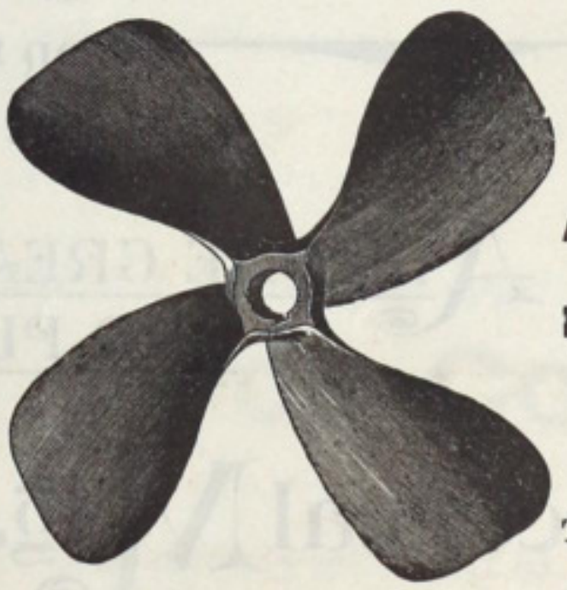
BUFFALO, N. Y.,

MANUFACTURERS OF

TRIPLE EXPANSION, THREE CYLINDER, FORE AND AFT And STEEPLE COMPOUND MARINE ENGINES,

High and Low Pressure Engines, Sectional, Propeller, Tug and Yacht Wheels.

Cowles Aluminum and Manganese Bronze Propeller Wheels.



These Wheels are noted for their extra speed, towing power and proportionate saving of coal.

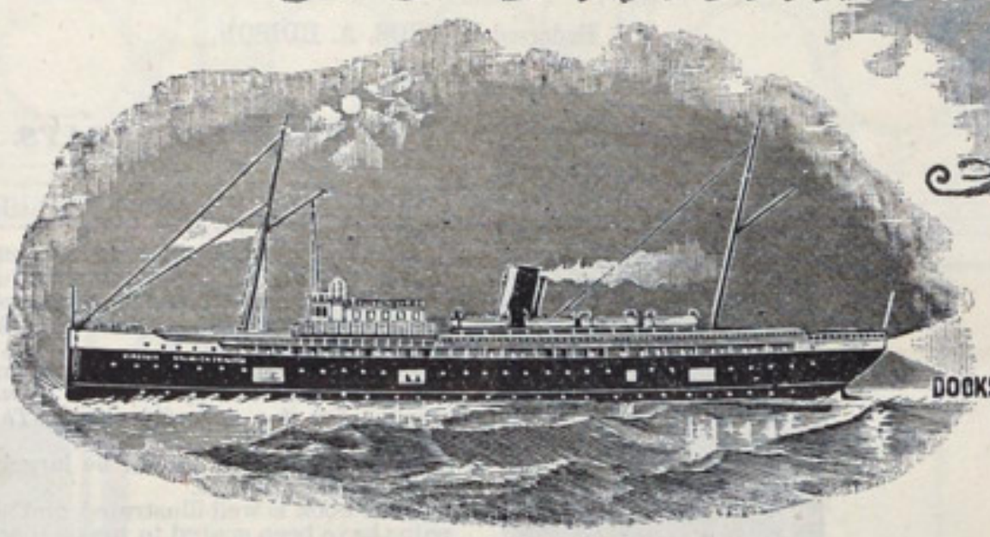
PRICES QUOTED ON APPLICATION.

"PL" DIXON'S "PL" GRAPHITE.

Dixon's Perfect Lubricating Graphite is indispensible to every engineer and machinst. It can be used dry or mixed with water, oil or grease. We send free of charge a sample and pamphlet with interesting and instructive information.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

E. S. Richardson Fueling Co.



COAL

DOCKS { FOOT OF NORTH MARKET ST. 18TH STREET BRIDGE. ILLINOIS CENTRAL SLIP "C."

ROOM 7 METROPOLITAN BLDG.

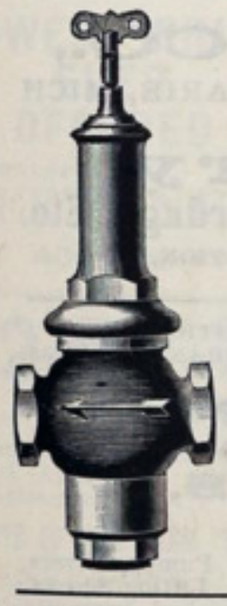
CHICAGO.

For Sale, Cheap

STEAMER HENRIETTA,

Suitable for short passenger or ferry route. Dimensions: 130 feet long, 28 feet beam, and 6 feet hold. Engines: Two horizontal, 14 by 48 inches, steam being furnished by two 12 feet by 42-inch boilers, with 32 3-inch flues. Stern wheel. Draft, light 3½ feet; loaded 5 feet. Capacity 150 tons coal. Two smoke stacks. Address,

A. W. PRIEST, - Kaukauna, Wis.



THE MASON REDUCING VALVE

Was adopted by the U. S. Naval Engineering board. It is the standard in the Danish and other foreign navies; also on the Pennsylvania and 120 other railroads. It is made to wear.

MASON REGULATOR CO.
BOSTON, MASS.

1880. 1893.

CHAS. H. POTTER & CO.,

Investment Bankers,

Cleveland, O.

Dealers in

Lake Superior Iron Mining Stocks,

on about 10 per cent. annual dividend basis, Republic Iron Co., Lake Superior Iron Co., Champion Iron Co., Minnesota Iron Co., Jackson Iron Co., Cleveland-Cliffs Iron Co., Chandler Iron Co., Chicago and Minnesota Ore Co.

C. H. McCUTCHEON,

(Successor to SAMUEL McCUTCHEON.)

Copper, Tin and Sheet Iron Manufactory,

Steamboat and Engineers' Supplies.

All kinds of Brass Cocks, Globe Valves and Couplings, &c. Iron Pipe and Fittings, and Mill Supplies. Rubber Belting, Hose and Packings, Springs, Valves, &c., Leather Belting and Usudurian Packing.

Telephone No. 68. No. 18 Ohio Street, BUFFALO, N. Y.

Syracuse Tube Company,

SYRACUSE, N. Y.

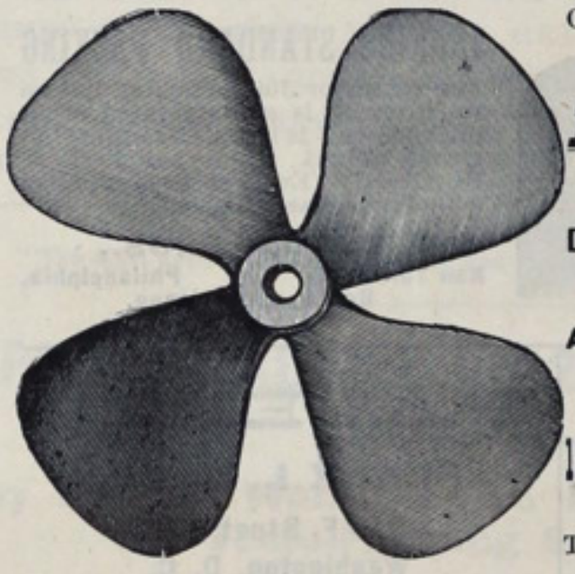
MANUFCTURERS OF

BOILER TUBES

OF THE BEST GRADES ONLY.

The Belleville Boilers in the two Great Northern Steamers are constructed of Syracuse Tubes.

SHERIFFS MANUFACTURING COMPANY,



C. STARKE, Pres. W. H. MEYER, V. Pres.
THOS. W. SHERIFFS, Manager.

MANUFACTURERS OF

MARINE :: ENGINES,

PROPELLER WHEELS,

Dredge Machinery of Latest Design.

MARINE REPAIRS AT ALL HOURS.

Agents for Marine Trade for BANGS' OIL CUPS.

124, 126 128, 130 & 132 Barclay Street,
MILWAUKEE, WIS

Telephone 163. Corresponpence Solicited.

Barge Brooklyn For Sale!

This barge is lying at Toledo and is in fair condition.

She will carry 650 tons of coal. Her fit-out is in good condition. Can be bought for $800 if sold at once.

GEO. E. HARDY, 140 Water St., TOLEDO, O.

MARINE REVIEW LINER EXCHANGE.

Space under this heading may be used gratis by our advertisers or subscribers to call attention to vessels or any craft, machinery, new or second hand, that they may have for sale. Those wanting machinery of any kind or wishing to purchase vessels, are invited to take advantage of the same offer. Employers in need of professional men or men who want positions may avail themselves of the opportunities offered. Each item will be limited to three lines. Letters concerning same must mention number attached to item and be addressed MARINE REVIEW, 516 Perry-Payne Building, Cleveland, O.

255—WANTED—Second hand naphtha launch that will carry about 25 passengers.

257—FOR SALE—Cheap; new Simmerly derrick.

258—WANTED—To buy a tug for spot cash. Not less than 20 square nor more than 22. Give full description and bottom cash price.

259—FOR SALE—Tug 100 feet long, 20 feet beam and 56 tons net, built of Delaware oak; diagonal knees and galvanized fastenings. Equipped with powerful compound engines. Boat now in service in Philadelphia.

STERLING, WELCH & CO.

12 and 14 Euclid Ave., CLEVELAND, O.

BOAT FURNISHING A SPECIALTY.
CARPETS, OIL CLOTHS,
CURTAINS, &c., &c.
SUPPLIED AT WHOLESALE RATES.

JENKINS STANDARD PACKING

For Steam or Joint Packing has no superior. It is manufactured in all thicknesses. It is not LOADED to increase weight. Does not ROT or BURN OUT. Every sheet is stamped with Trade Mark, like cut.

JENKINS BROS.,
New York, Philadelphia,
Boston and Chicago.

EDWARD C. WEAVER, LL. M.,

PATENTS

900 F. (op. Pat. Office.) Washington, D. C. Attorney and Counsellor in Patents, Trade Marks, Revenue Claims and all claims against the U.S. Make a clear statement of your invention or claim, and I will advise you free of charge. Send stamp for my phamphlet.

PATENTS.

FRANK L. DYER,
918 F. Steet,
Washington, D. C.

References: American Steel Barge Co.; Capt. Alexander McDougall.

U. S. ENGINEER OFFICE, Burlington, Vt., September 5, 1894.—Sealed proposals in triplicate, for dredging in Great Chazy River, N. Y., will be received here uutil 2 p m., October 5, 1894, and then publicly opened. Full information furnished on application to Smith S. Leach, Capt Engineers. 27

U. S. ENGINEER OFFICE, Burlington, Vt., September 5, 1894.—Sealed proposals in triplicate, for repairs to Burlington Breakwater, Vt., will be received here until 2 p. m., October 5, 1894, and then publicly opened. Full information furnished on application to Smith S. Leach, Capt. Engineers, 27

FRANKLIN HOUSE

Cor. Bates & Larned sts. only a block from Woodward & Jefferson Aves., **DETROIT, MICH.** THOROUGHLY RENOVATED. Very central. Per day, $1.50. H. H. JAMES.

A copy of the 50-cent North West edition will be mailed to any one sending a $2 subscription within 30 days to the
MARINE REVIEW,
516 Perry-Payne Bldg., Cleveland O.

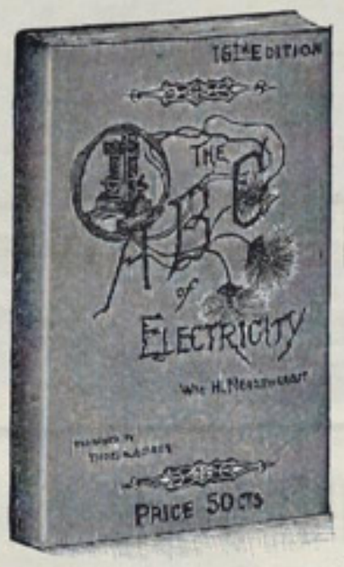
PATENTS

Promptly secured. Trade-Marks, Copyrights and Labels registered. Twenty-five years experience. We report whether patent can be secured or not, free of charge. Our fee not due until patent is allowed. **32 page Book Free.**
H. B. WILLSON & CO., Attorneys at Law,
Opp. U. S. Pat. Office. **WASHINGTON, D. C.**

ABC OF ELECTRICITY

By WILLIAM H. MEADOWCROFT

Endorsed by THOS. A. EDISON.



WHAT THE PRESS SAYS.

"A clear and comprehensive little treatise."—*N. Y. Sun.*

"Electric Science is making magnificent strides and this book fills a useful office in setting forth the features and characters of these advances."—*Brooklyn Times.*

"The need of such a book has undoubtedly been felt by many . . we predict for it a splendid sale."—*The Age of Steel.*

"A book like this should be largely read."—*N. Y. Herald.*

"The book is well illustrated, and no pains have been spared to make it accurate and reliable throughout."—*Electrical Review.*

"In simple language, the author lays bare the secrets of electrical science and application."—*Electrical World.*

"A vast amount of useful importance."—*Washington Post.*

FROM THE LABORATORY OF THOS. A. EDISON,
ORANGE, N. J., Sept., 24, 1888.

DEAR SIR—I have read the MS. of your "A B C of Electricity," and find that the statements you have made therein are correct. Your treatment of the subject, and arrangement of the matter, have impressed me favorably.

Yours truly,
THOS. A. EDISON.

PRICE, 50 CENTS.

MARINE REVIEW, 516 Perry-Payne Bldg.,
CLEVELAND, OHIO.

P. M. CHURCH & CO.,

SAVINGS BANK BLOCK, SAULT STE. MARIE, MICH

LEADING DEALERS IN

Ship Chandlery,

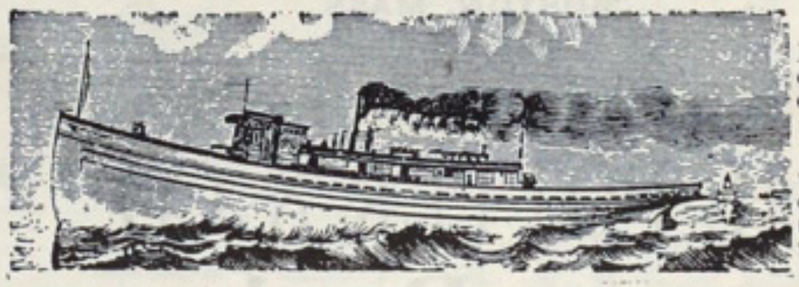
Marine Hardware, Paints, Oils, Packings, Cordage, Etc.

FIRST-CLASS COPPERSMITH AND TINSHOP IN CONNECTION.

H. A. HAWGOOD, President. PHILIP MINCH, Vice-President. GEO. ELSEY, Jr., Gen. Mgr. J. A. SMITH, Sec'y. J. R. SPRANKLE, Treas.

The Cleveland Tug Co.

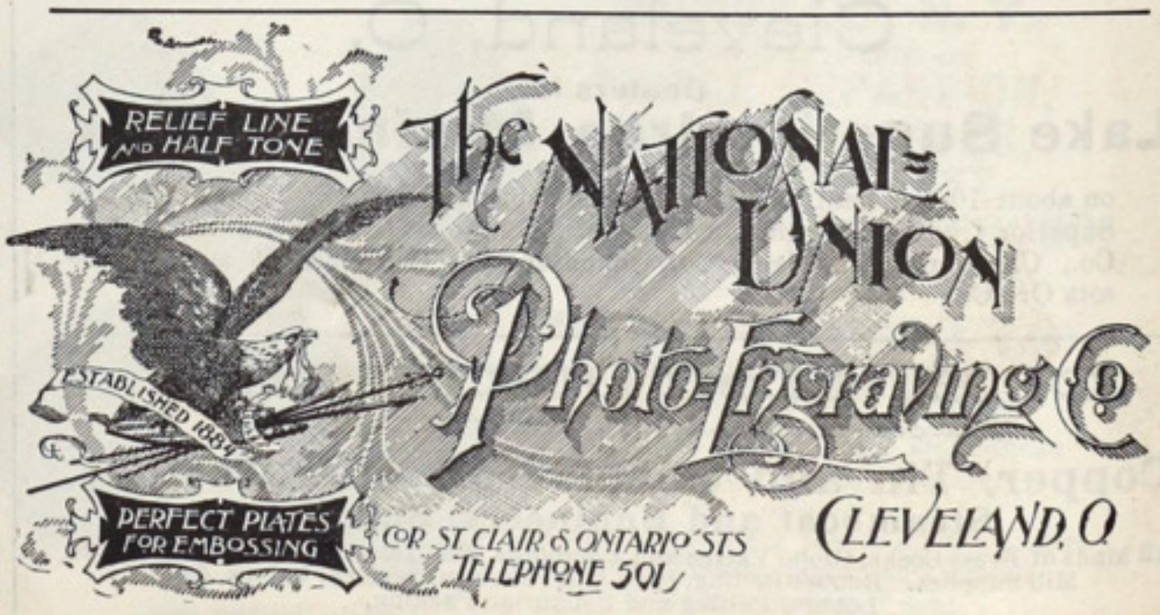
FIRST-CLASS TUGS,



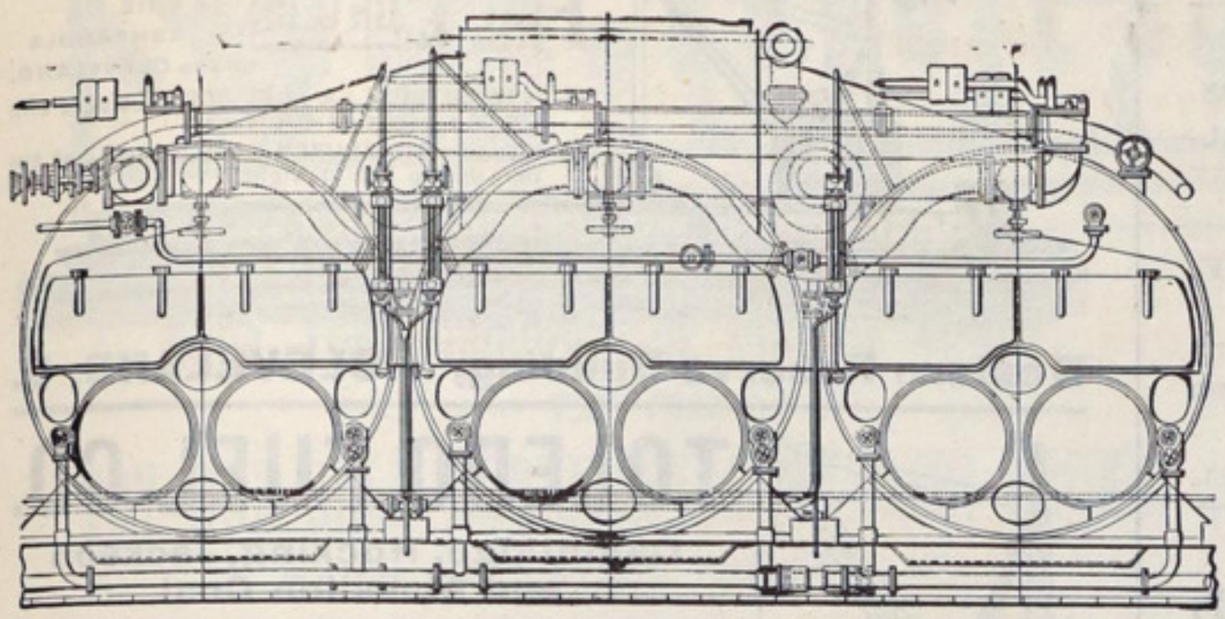
Steam Pumps, Divers, Hawsers, Lifting Screws, etc., furnished promptly on orders by telegraph or otherwise.

Steamers when outside wanting our Tugs, blow one long whistle and as many short ones as they want Tugs.

Office, Open Day or Night, East End Main St. Bridge,
Long Distance Telephone 919. CLEVELAND, OHIO.



LAKE ERIE BOILER WORKS, BUFFALO, N. Y.



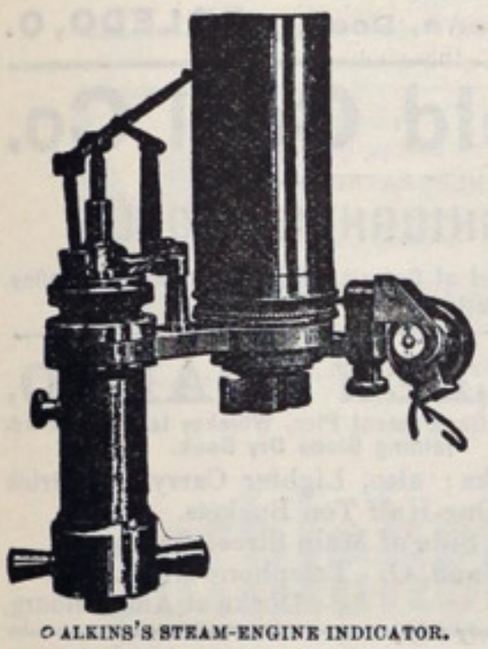
THE BEST EQUIPPED PLANT IN AMERICA

FOR THE MANUFACTURE OF

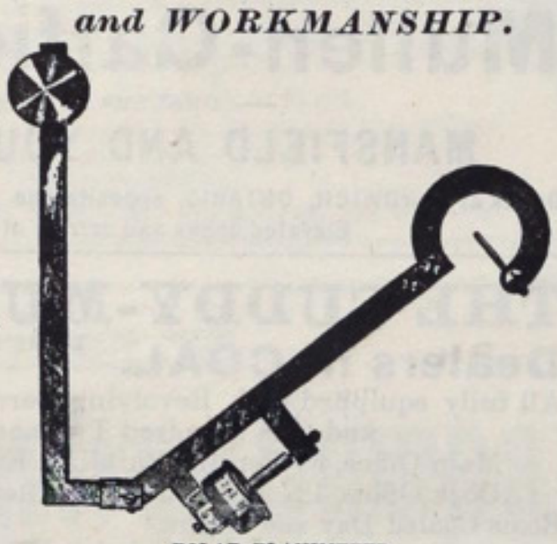
MODERN MARINE BOILERS.

FIRST-CLASS INSTRUMENTS

of APPROVED DESIGN, BEST MATERIAL and WORKMANSHIP.



O ALKINS'S STEAM-ENGINE INDICATOR.



POLAR PLANIMETER.

Performance Guaranteed—NO CO, NO PAY.

LOWEST PRICES EVER OFFERED: Indicator, $25, Planimeter, $5, Pantograph, $5, Extra Spring, $2, Three-Way Cock, $5, Or Complete Outfit h 2 Springs, **$40.**

ADDRESS:

NEPTUNE METER CO., Manufacturers of Water Meters and Steam Engine Indicators,

408-409-410 Temple Court Bldg., NEW YORK CITY

$2.50 CLEVELAND To BUFFALO

Via "C. & B. LINE."

Commencing with opening of navigation (about April 1st). Magnificent side-wheel steel steamers

"STATE OF OHIO" AND "STATE OF NEW YORK."

DAILY TIME TABLE. Sunday included.

Lv. Cleve'd, 6:15 P.M. | Lv. Buffalo, 6:15 P.M.
Ar. Buffalo, 7:30 A.M. | Ar. Cleveland, 7:30 A.M.

Central Standard Time.

Take the "C. & B. Line" steamers and enjoy a refreshing night's rest when enroute to **Buffalo, Niagara Falls, Toronto, New York, Boston, Albany, 1,000 Islands,** or any Eastern or Canadian point.

Cheap Excursions Weekly to Niagara Falls.

Write for tourist pamhhlet.

H. R. ROGERS, Gen'l Pass. Agt.
T. F. NEWMAN, Gen'l Manager.
Cleveland, O.

THE D&C TO MACKINAC. DAILY LINE BETWEEN CLEVELAND AND DETROIT.

The Detroit & Cleveland Steam Navigation Co.

Daily for Detroit, 10 p.m.
Daily for Put-in-Bay, 8:30 a.m.
Lakeside and return. Mon. and Sat.
Moonlight Rides only 25 cents. Every Tues., Wed. and Fri., 8 p. m.

Wharf foot of Superior St.

Special arrangements made with Societies, etc., for Put-in-Bay, Lakeside and Lake Rides.

A. A. SCHANTZ, G. P. A., Detroit, Mich.
D.C. MCINTYRE, G.F.&D.P.A., Cleveland, O.
JULIUS C. MENGENSDORF, City Pass. Agt., Cleveland, O.

T.S.&J.D.NEGUS

Have the largest and finest stock of Nautical Instruments and Charts in the United States.

Estimates given for

Outfits of Steamers and Pleasure Yachts.

Compass Adjusters.

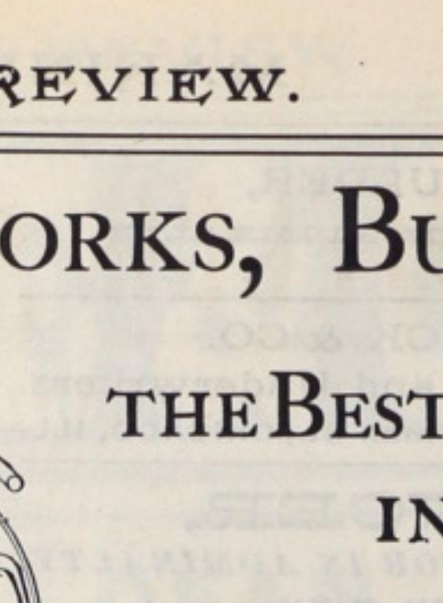
Send for Catalogue and Almanac.

140 Water St., New York City.

Every attention given to Trade orders.

Try the new NEGUS LOG. Best in the World.

Special Agents for the Celebrated Ritchie Compass.



Operated entirely by One Handle.

No Valves required in either Steam for Suction Pipes.

THE BUFFALO AUTOMATIC.

A GRADING INJECTOR.

The movement of the steam and water valves and their relative positions are such that the supply of water will always be in proportion to the supply of steam admitted to the jets. CAN BE GRADED to run continuously on any steam presssure from 20 to 140 lbs. Operated entirely by one handle, both in stopping and starting, as well as in grading the supply of steam and water. Eagle Ejectors, Duplex Tube Scrapers, Cylinder Oil Pumps Improved Glass Oil Cups and Lubricators, Compression Grease Cups, Improved Ball Gauge Cocks, and other **Steam Users' Specialties.**

Send for Catalogue, mentioning this paper.

SHERWOOD MFG. CO., (Sole Mfrs.) BUFFALO, N. Y.

FOR **PISTON RODS** WORKING UNDER HIGH PRESSURE A SUPERIOR ARTICLE.

UNION SEMI METALLIC PACKING

Composed of fine grade of Asbestos and Anti-Friction Wire and best of Lubricants.

SEND FOR SAMPLE, **HINE & ROBERTSON CO.** 40 Cortlandt St., N.Y.

SEND 20 CENTS IN STAMPS AND HAVE A COPY OF THF COLOR ETCHING OF THE STEEL STEAMER GRATWICK MAILED TO YOUR ADDRESS OR TO THE ADDRESS OF SOME FRIEND WHOM YOU WISH TO PLEASE. MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, O.

"The most perfect feed water heater and purifier we ever saw."—R. HAMMOND.

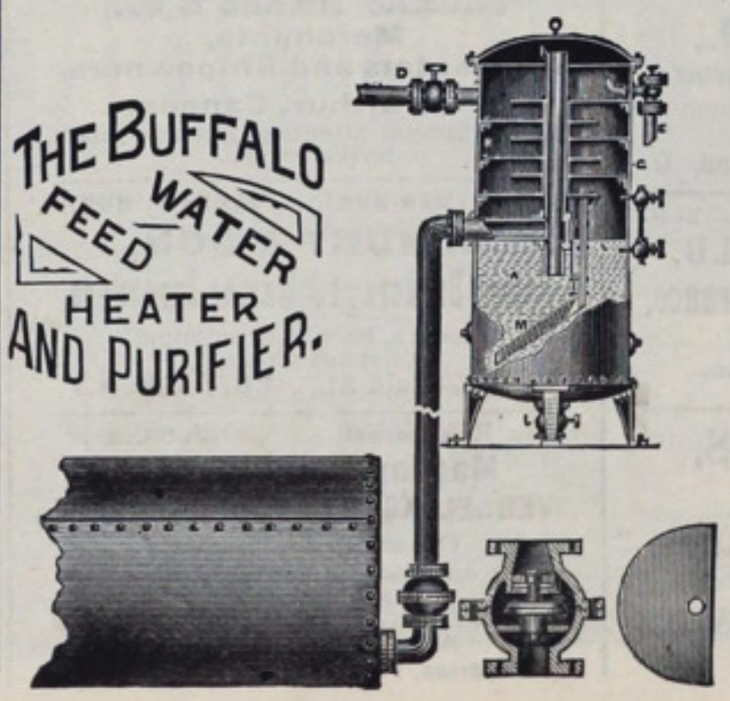
IN PRACTICAL USE ON 25 LAKE STEAMERS.

Every Purifier Warranted to Remove all Sediment or Scale-Forming Substance.

ROBERT LEARMONTH PATENTEE,

200 BOUCK AVENUE, - - - - - BUFFALO, N. Y.

THE BUFFALO FEED WATER HEATER AND PURIFIER.



REFERENCES.

A.—Settling chamber.
B.—Boiler.
C.—Feed pipe to boiler.
D.—Steam pipe.
E.—Water supply pipe.
F.—Check valve.
G.—Spray disks.
H.—Spray chamber.
I.—Equalizing tube.
J.—Blow-off pipe.
K.—Automatic shut-off valve.
L.—Division plate.
M.—Deflector and separator.

HARVEY D. GOULDER,
LAWYER AND PROCTOR IN ADMIRALTY,
CLEVELAND, O.

W. H. COOK.
CAPT. J. A. CALBICK.
J. B. CLOUGH.
COOK, CALBICK & CO.
Vessel Agents and Underwriters.
Tel., Main, 56. RIALTO BLDG., No. 23 Sherman St., CHICAGO, ILL.

H. R. SPENCER,
ATTORNEY AT LAW and PROCTOR IN ADMIRALTY.
218 Superior St., DULUTH, MINN.

C. E. KREMER, *Attorney and Counselor-at-Law and Proctorin Admiralty.*
Rooms 14, 15 and 16, Bryan Block, - - 164 La Salle St., CHICAGO, ILL.

HARVEY L. BROWN,
Attorney at Law and Proctor in Admiralty,
Buffalo, N. Y.

JOHN MITCHELL. JOHN F. WEDOW. ALFRED MITCHELL.
MITCHELL & CO.,
Vessel and Insurance Agents,
508, 509 and 510 Perry-Payne Building, CLEVELAND, OHIO.
Office Telephone, 737. Reidence, John Mitchell, 3506.

C. R. JONES & CO., VESSEL AGENTS,
FIRE AND MARINE INSURANCE.
Nos. 501, 502 and 503 Perry-Payne Bldg., CLEVELAND, O.

W. M. HAYDEN,
Lawyer and Proctor in Admiralty,
Depositions and Testimony
Taken as a Notary or under a commission. Legal business and collections promptly attended to.
1007 Soc. for Sav. Bldg., CLEVELAND, O.
Telephone 2297.

C. A. Macdonald. J. J. Rardon.
C. A. MACDONALD & CO.
General Insurance Agents,
RIALTO BUILDING, CHICAGO, ILL

H. S. LORD. J. H. NORTON.
LORD & NORTON,
Attorneys-at-Law, Proctors and Advocates in Admiralty,
DULUTH, MINN.

White, Johnson & McCaslin,
ATTORNEYS-AT-LAW,
—AND—
Proctors in Admiralty,
26-27 Blackstone Building,
CLEVELAND, - OHIO.

THOS. WILSON,
MANAGING OWNER
WILSON'S TRANSIT LINE.
Gen. Forwarder.
Freight and Vessel Agent.
CLEVELAND, O.

C. F. Palmer. Chas. Hutchinson.
P. J. Minch.
PALMER & CO.,
Vessel Owners and Agents,
(John H. Palmer and Jonn T. Hutchinson, Associates.)
Perry-Payne Bldg., Cleveland, O.

W. A. HAWGOOD. C. C. CANFIELD.
HAWGOOD & CANFIELD,
Vessel Agents and Marine Insurance,
604-605 Perry-Payne Bldg.,
Cleveland, - Ohio.
Telephone No. 2395.

GEO. D. FELLOWS,
VESSEL AGENT,
Fire & Marine Insurance.
Cargoes a Specialty.
WHOLESALER OF SALT.
RACINE, WIS.

ORESTES C. PINNEY,
Lawyer and Proctor in Admiralty.
Rooms 722 and 723 Perry-Payne Bldg.
CLEVELAND, OHIO.
Telephone 2585.

ISAAC N. HUNTSBERGER,
ATTORNEY-AT-LAW,
—AND—
PROCTOR IN ADMIRALTY,
TOLEDO, OHIO.

E. T. HITCHCOCK,
Average Adjuster,
184 Main St.,
BUFFALO, N.Y.

H. J. WEBB & CO.
SHIP BROKERS, VESSEL OWNERS and AGENTS,
Established in 1856. H. J. Webb & Co. will charter vessels for the lake trade. Special attention given to chartering vessels in the Lake Superior Iron Ore trade, both for the season and single trip.
No. 606 & 607 Perry-Payne Building, Cleveland, O. Office Telephone No. 338, Residence No 3228.

J. T. ROSE. FRANK B. LAZIER.
ROSE & LAZIER,
Vessel Agents and Brokers, and Marine Insurance,
16 Board of Trade,
DULUTH, - - MINN.

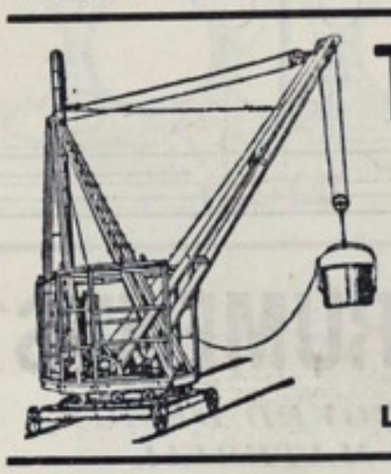
Established 1857.
THOMAS MARKS & CO.,
Merchants,
Forwarders and Shipowners,
Port Arthur, Canada.
N. B.—Special attention given to chartering vessels.

Capt. LYMAN HUNT. JAMES P. HUNT.
L. HUNT & SON,
Vessel Brokerage & Marine Insurance,
Room 9, Exchange Building.
Telephone No. 522.
No. 202 Main St., BUFFALO, N.Y.

Geo. H. Macdonell. J. J. O'Connor.
Macdonell & O'Connor,
VESSEL AGENTS AND BROKERS,
Fire and Marine Insurance.
Boats consigned to our care will receive prompt despatch.
Special attention to chartering out of Port Arthur and Fort William.
Address, PORT ARTHUR, CANADA

Pickands, Mather & Co.,

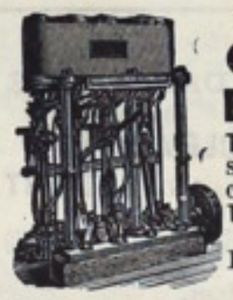
FUEL LIGHTERS AT BUFFALO, ERIE, ASHTABULA AND CLEVELAND.
At DETOUR, MICH., A FUEL DOCK equipped with Shute capacity of 600 Tons.
Best Quality PITTSBURGH COAL furnished at any time during Day or Night.
Western Reserve Building, CLEVELAND, O.

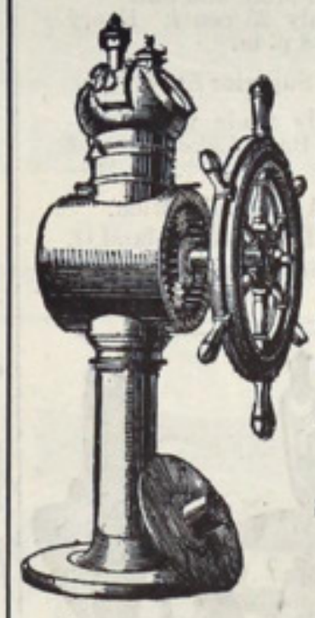

TOLEDO FUEL CO.
Cambridge, Hocking, Jackson and Massilon Coal
Wheeled on or put on with DERRICK.
NIGHT OR DAY.
SATISFACTION GUARANTEED.
H. H. WILLIAMS, Manager.
Located on Penn. Dock, TOLEDO, O.

Mullen-Gatfield Coal Co.
— DEALERS IN THE CELEBRATED —
MANSFIELD AND YOUGHIOGHENY COALS.
Docks at SANDWICH, ONTARIO, opposite the Fort at Detroit, with chutes for rapid fueling.
Elevated docks and derrick at AMHERSTBURG, ONTARIO.

THE CUDDY-MULLEN COAL CO.
Dealers in COAL.
Docks at Government Pier, Whiskey Island, and Adjoining Globe Dry Dock.
All fully equipped with Revolving Derricks; also, Lighter Carrying Derrick and One Hundred Two and One-Half Ton Buckets.
Main Office, 81 Perkins Building, East Side of Main Street Bridge.
Dock Office, 127 West River St., Cleveland, O. Telephone No. 8.
Boats Coaled Day and Night. Docks at Amherstburg,

Ohio & Pennsylvania Coal Co.
FUEL DEPARTMENT.
MINERS AND SHIPPERS,
Youghiogheny and Ohio Steam Coals. Steamboats, Tugs, etc., Coaled day or night, Docks Foot West River Street. Whiskey Island Government Pier and C. & P. R. R. Slips. Also STEAM LIGHTER—Equipped with Revolving Derrick and (100) two ton buckets.
Telephone 1608. Office, 130 West River St., CLEVELAND, OHIO.


STEAM YACHTS USE
Compound Engines
To Increase Power, and save one-third boiler capacity.
The Coulter & McKenzie Machine Co.,
P. O. Box 1127.
Bridgeport, Conn.


SNELLING'S PATENT STEERER
For Steamers, Ships, Tugs, Yachts, Coal Barges, Etc.
The drum has powerful internal gearing.
No Purchase Blocks needed.
Simple as the common "wheel and drum."
Powerful as any Screw Steerer.
An excellent relief or auxiliary gear for vessels that steer by steam.
Send for Circular.
J. H. SNELLING,
158 South Street,
NEW YORK.

MECHANICS

Diplomas Awarded. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE circular, stating the subject you wish to study to
THE CORRESPONDENCE SCHOOL OF MECHANICS,
SCRANTON, PA.

H. A. BARR, President, Escanaba. F. H. VAN CLEVE, Sec. Escanaba. CAPT. GEO. BARTLEY, Supt. Escanaba.
ESCANABA TOWING & WRECKING CO., Escanaba, Mich.
Tugs, Lighters, Steam Pumps, Hawsers, Hydraulic Jacks and Diving Appliances always ready.
TUG MONARCH, } Engine Compound, Cylinder 16 and 30 inches diameter, 30 inch. Stroke, Steam Pressure Allowed, 125 pounds.
TUG DELTA, } Cylinder 20 by 22, Steam Pressure Allowed, 105 pounds.
TUG OWEN, } Cylinder 20 by 20, Steam Pressure Allowed, 104 pounds.
CENTRIFUGAL PUMPS, Seven and Fourteen Inch Suction

S. F. HODGE & CO.

MARINE ENGINES,
PROPELLER WHEELS,
DECK HOISTERS,
MARINE REPAIRS.

320 ATWATER STREET,
DETROIT, MICH.

Does Your Commutator Cut or Spark?

— IF SO,—

TRY OUR SELF-LUBRICATING DYNAMO BRUSH,

WHICH ABSOLUTELY PREVENTS IT.

MANUFACTURED BY

The F. P. Little Electrical Construction and Supply Co.

No. 135 Seneca St., BUFFALO, N. Y.

SEND FOR PRICES.

Paint your Vessels with **L S. G. Graphite Paint.**

NO BLISTERING, CRACKING OR SCALING

Made especially for Stacks, Decks, Sides, Hulls and Water Compartments. Strictly anti-rust, and most durable and economical.

DETROIT GRAPHITE MFG. CO., 541 River St., Detroit, Mich.

— THE —

Bethlehem Iron Company

PRINCIPAL OFFICE and WORKS:

SOUTH BETHLEHEM, PENNA.

Steel Rails, Open Hearth, Bessemer and Nickel Steel Billets and Forgings.

Hydraulic Forged Shafting, Hollow or Solid.
Cranks, Rolls, Etc.

Rough Machined or Finished. **Fluid Compressed Steel.**

GUNS and ARMOR.

New York Office,
80 Broadway.

Philadelphia Office,
421 Chestnut St.

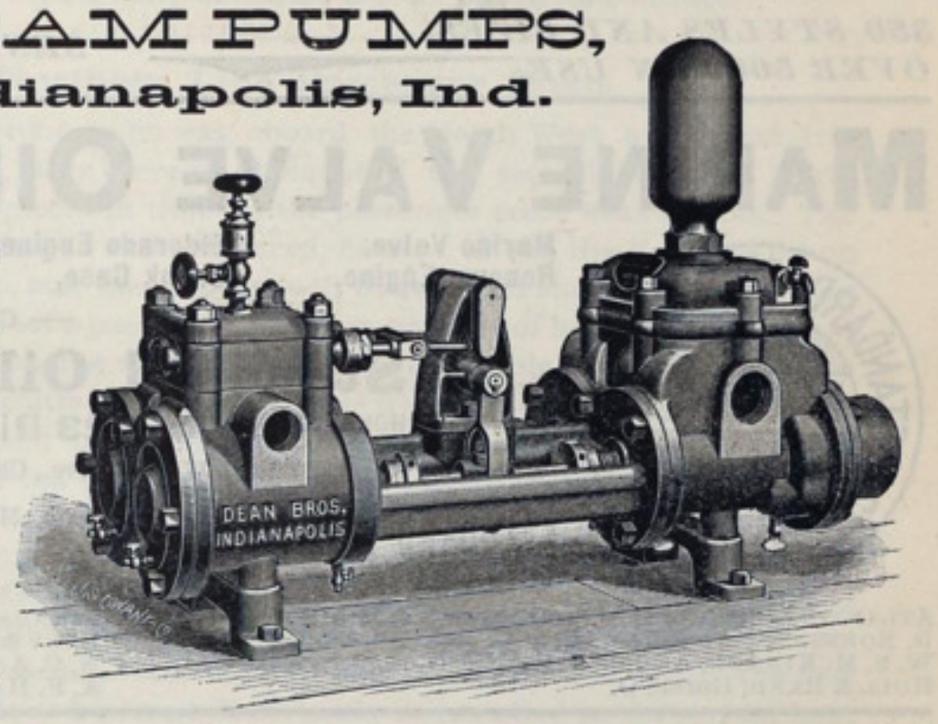
DEAN BROTHERS,

STEAM PUMPS,

Indianapolis, Ind.

Boiler Feeders, Air Pumps and Condensers, Ballast Pumps, Fire Pumps, Bilge Pumps.

SEND FOR CATALOGUE



Correspondence School of Technology,

CLEVELAND, OHIO, Instruction by Correspondence in Electrical, Steam and other Branches of Engineering.—E. P. Roberts, M. E.; Oscar Antz, M. E.; Jas. Ritchie, B. S.; Frank C. Osborn, C. E.; J. N. Dodd, A. M.; F. Yensen; L. S. Siebel; H. J. Cook; J. N. Richardson; W. B. Sewart and F. H. Constant, C. E. Send for Circular.

THE CONDIT FULLER CO.

CLEVELAND, OHIO.

BAR IRON, SHEET IRON, PLATE IRON, PIG IRON,
BOILER RIVETS,
BOILER TUBES, PLATE STEEL,
GAS PIPE, BOAT SPIKES,
CLINCH RINGS, STEEL NAILS.

Sales Agents of

THE CARBON STEEL CO.

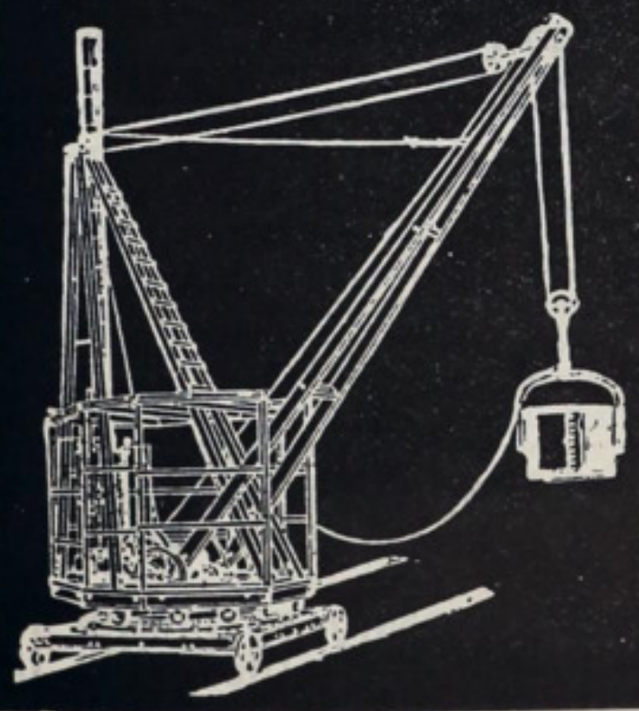
Manufacturers of
OPEN HEARTH STEEL,
SHIP PLATES, BOILER PLATES,
ARCHES and STRAPS FOR VESSELS A SPECIALTY.

Write for Prices and List of Sizes.

McMYLER MANUFACTURING CO., 180 COLUMBUS STREET, CLEVELAND, O.

SOLE MAKERS OF THE

McMYLER PATENT REVOLVING STEAM DERRICK



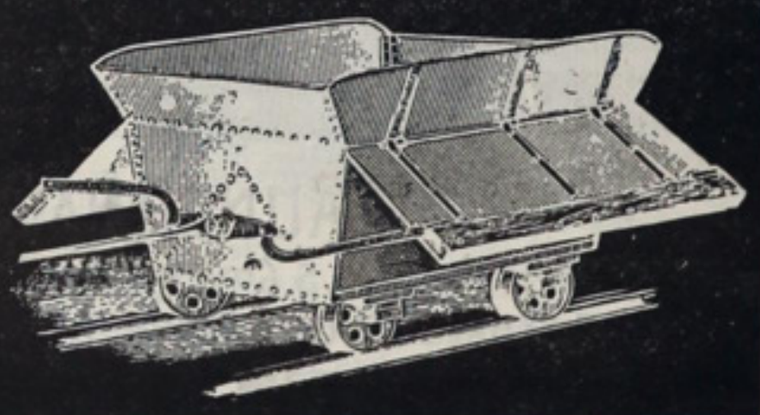
FOR HANDLING COAL, ORE AND COARSE FREIGHT OF ANY DESCRIPTION.

This Derrick can Lift Load, Alter the Radius of Boom, Swing in Either Direction at Will of Operator, and can Propel Itself on Track any Desired Distance.

BUILT FOR ANY CAPACITY WANTED

BUILDERS OF

CONVEYORS, COAL BUCKETS, ORE BUCKETS AND DUMP CARS.



FRONTIER IRON WORKS
MARINE ENGINES,
DETROIT, MICH.

AMERICAN SHIP WINDLASS CO.
P. O. BOX 53, PROVIDENCE, R. I.
BUILDERS OF THE
"Providence" Windlasses and Capstans
350 STYLES AND SIZES. OVER 5000 IN USE.
SEND FOR CATALOGUE.
FRANK S. MANTON, AGENT.

MARINE VALVE OIL For Internal Lubrication
Renown Engine Oil For External Lubrication.

Marine Valve, Renown Engine, Eldorado Engine, Crank Case, Victor Signal, Dark Lubricating, Mineral Seal, Head Light, Artic Cup Greases, and Lard Oils.

— CARRIED IN STOCK AT THE —

Standard Oil Company's Marine Depot,
TELEPHONE 77. 123 River Street, CLEVELAND, O. MAIN OFFICE TELEPHONE 682.

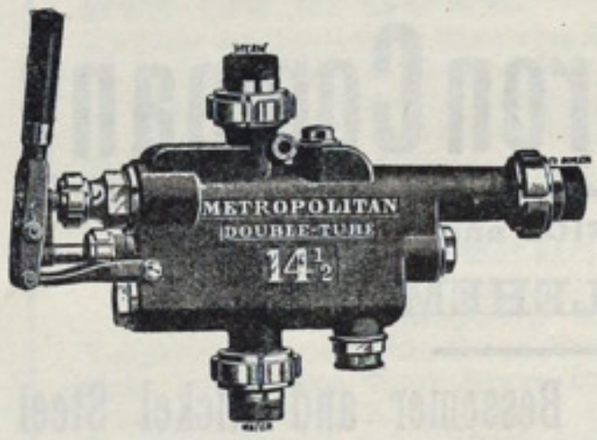
ALSO FOR SALE BY STANDARD OIL COMPANY,
No. 5 Wabash Ave., Chicago, Ill.
Racine, Wis.
Broadway & Mason, Milwaukee, Wis.
Sheboygan, Wis.
Manitowoc, Wis.
Green Bay, Wis.
Marinette, Wis.
Oshkosh, Wis,
Duluth, Minn,
West Superior, Wis.
Hancock, Mich.
Marquette, Mich.
Sault Ste. Marie, Mich.
Michigan Central Railway & 10th St., West Bay City, Mich.
Eighth & Sears Sts., Saginaw, Mich.
46 Jefferson, Detroit, Mich.
Summit & Monroe Sts, Toledo, O.

ATLANTIC REFINING COMPANY, French & 16th Sts., Erie, Pa.
D. ROBESON, Port Huron, Mich.
W. S. MCKINNON, Ashtabula Harbor, O.
HULL & RAND, Huron, O.
STANDARD OIL COMPANY, Star Oil Works, Buffalo. N.Y.
BABY & DALE, St. Clair, Mich.
N. C. ALTEN, Lorain, O.
A. F. HARRINGTON, Conneaut Harbor, O.
A. H. MCGONAGIL, South Chicago, Ill.
MARINE SUPPLY CO., Fairport, O.
F. KRANZ, Sandusky, O.
THE M. I. WILCOX CORDAGE & SUPPLY CO., Toledo, O

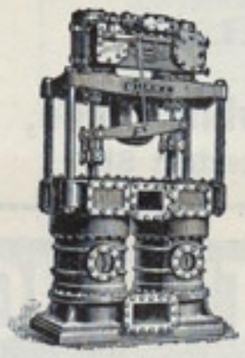
COAL
STANLEY B SMITH & CO.
OPERATING
SMITH'S COAL DOCK
POCKET FUELING AND LOW DOCK,
DETROIT, MICH.
OFFICES: DETROIT MICH.
LORAIN, OHIO.
OPERATING
LORAIN COAL DOCK
LAKE SHIPPERS OF STEAM COAL.
STEAMBOAT FUELING

"See Quadruple Expansion Engine"
SAVES SPACE AND FUEL.

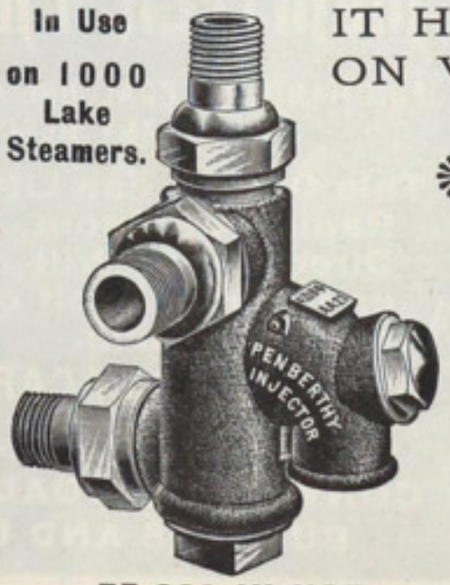
Particulars of the above and list of vessels where applied furnished on application.
Sole Manufacturer under the Patents,
HORACE SEE, No. 1 Broadway, NEW YORK.

THE METROPOLITAN DOUBLE-TUBE INJECTOR.


ADOPTED by the Largest Shipbuilders and users, as it is . . . .
The Only Injector which Gives Satisfaction
UNDER the SEVERE CONDITIONS OF MARINE SERVICE.
SEND FOR OUR CATALOGUE 1894
THE HAYDEN & DERBY MFG. CO.
No. 111 and 113 Liberty St., NEW YORK.

THE GEO. F. BLAKE MFG. CO.

AIR PUMP ON U.S. CRUISER NEW YORK.
BUILDERS OF
MARINE PUMPS
Single and Duplex Pumps for Boiler Feed, Fire or Bilge Service—Vertical and Horizontal.
Vertical and Horizontal Pumps, Air Pumps for Surface and Jet Condensers.
95 and 97 Liberty St., NEW YORK.

WARD BOILERS FOR STEAMERS LARGE OR SMALL
LIGHT WEIGHT, GREAT POWER
THREE TYPES
LAUNCH, NAVY AND MARINE.
ADOPTED BY U.S. GOVERNMENT. WAR VESSELS, LAUNCHES, REVENUE CUTTERS, TUGS.
AFTER THE MOST EXHAUSTIVE COMPETITIVE TESTS. Correspondence Invited.
CHARLES WARD,
CHARLESTON, KANAWHA CO., W. VA.

In Use on 1000 Lake Steamers.


75,000 IN USE.
IT HAS NO EQUAL ON WATER OR LAND.
ITS MERITS ARE EVERYWHERE ACKNOWLEDGED.
Insist on having a
PENBERTHY Automatic INJECTOR.
PENBERTHY INJECTOR CO.
Detroit, Mich.